THE ONLY MAGAZINE FOR THE COMMODORE 64

your 64 & VIC 20

Launch Issue!

95p No.1



ON THE BENCH

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FIRING-UP BASIC

Key In Nine New Words

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Y64 MENU

ON THE BENCH





PACK REVIEWS



CORE MATERIAL

Y64 wishes to thank 'Tomorrow's World' of Oxford Street for the generous loan of both hardware and software used in this magazine.

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CASSETTE £8 DISK £9.95

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ADVENTURE REVIEWS

"Adventures which have a fast response time, are spectacular in the amount of detail and number of locations, and are available to cassette owners . . I am extremely impressed . . The Level 9 Adventures are superbly designed and programmed, the contents first rate. The implementation of Colossal Cave (Adventure) is nothing short of brilliant; rush out and buy it. While you're at it, buy their others too. Simply smashing!"

– SOFT, Sept 83

"I found Dungeon exceedingly well planned and written, with a fast response. There are well over 200 locations and the descriptions are both lengthy and interesting. The objects number about 100. It could therefore take some months to explore the whole network, giving many hours of enjoyment in the process."

– C&VG, Sept 83

"The descriptions are so good that few players could fail to be ensnared by the realism of the mythical worlds where they are the hero or heroine . . . great fun to play."

–Which Micro?, Aug 83

"My appetite has been whetted and I intend to get my own copy (of Snowball) to play."

– What Micro?, Dec 83



ADVENTURE REVIEWS

"This has to be the bargain of the year. If adventures are your game then this (Colossal Adventure) is your adventure."

– HCW, 5 Sept 83

"Colossal Adventure is simply superb. Anyone who wishes to use adventures in an educational setting really must use and see this program as it emulates Crowther and Wood's masterpiece so well. For those who wish to move onto another adventure of similar high quality, Dungeon Adventure is to be recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!"

– Educational Computing, Nov 83

Colossal Adventure is included in Practical Computing's Top 10 games choice: "Poetic, moving and tough as hell."

– PC, Dec 83

"To sum up, Adventure Quest is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you"

– NILUG # 1.3

"Colossal Adventure . . For once here's a program that lives up to its name . . a masterful feat. Thoroughly recommended"

– Computer Choice, Dec 83

"wholly admirable"

– Your Computer, Sept 83

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The first of Pete Austin's second trilogy. The giant colony starship, Snowball 9, has been sabotaged and is heading for the sun in this massive game with 7000 locations.

THE LORDS OF TIME SAGA

7: LORDS OF TIME
Our congratulations to Sue Gazzard for her super design for this new time travel adventure through the ages of world history. Chill to the Ice-age, go romin' with Caeser's legions, shed light on the Dark Ages etc. etc. We'll be selling this game mail-order from January 1st.

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OPEN ACCESS

An in-depth look at the world of Commodore computing — rumours and reviews, fun and philosophy, and the news behind the news — it's all here . . .

GAMES

Audiogenic Launch Well-Tried Favourites On Disk

As more and more 64 owners upgrade to disk drives, Audiogenic has now launched a range of disk-base games at the very reasonable price of £12.95. Some of the these are already well-tried favourites from their tape catalogue and the first five include *Pegasis*, *Aztec Challenge*, *Slinky* and *Forbidden Forest* (which you can read all about in this issue).

Audiogenic says all the games combine the visual thrills of the arcade with the sort of interaction you expect to find from the traditional adventure, and involve play on a number of difficult levels. In fact, some of the higher levels are not even included in the manuals. So Audiogenic is laying on a 'counselling service' to help out confused travellers to these uncharted territories. You'll be able to receive moral support and hints on how to navigate these unglimpsed horrors by writing to them with details of your experiences. All this data will be accumulated on file so there'll be a pool of information available to help you on your way. Meanwhile, can anybody rescue our Art Director from the deadly piranha pool of *Aztec Challenge*?

BUSINESS

Imagine Reverses Decision On Price War

After an announcement in late March that the company was reducing the price of its games to an all-time low of £3.95, Imagine has had second thoughts — or is it third?

"We got it wrong," confesses operations director Bruce Everiss. "Although market research indicated that we could have sold many more games by breaking below the £4 barrier, we totally underestimated the effect this might have on the software industry as a whole."

The Liverpool-based company now confirms that all items on its current games list will retail at £5.50 — which is still below the average price of many rival software houses.

Meanwhile, "behind locked doors", Imagine is pushing ahead with work on "two revolutionary mega-games" for the Commodore 64 and the 48K Spectrum. The promise is that both *Psyclapse* and *Bandersnatch* will be far more than just simple games cassettes and should be launched, hopefully, in June. Wonder what the price will be by then!



Bruce Everiss — Imagine's software prices yo-yo on.

LITERATURE

Faulty First Issue Recalled

If you were one of the thousands of unfortunates who shelled out on one of the Pan/*PCN* program books and consequently lost all faith in the power of the printed word, then be reassured: the bugs have now been well and truly exterminated. Both the VIC 20 and Commodore 64 books were withdrawn some weeks back and have now been reissued with all the faulty listings corrected.

If you didn't consign your copy to oblivion, Pan will be pleased to send you a corrected one if you return the title page of your book to them. As far as the new edition is concerned, the way to tell you're getting genuine article is the 'B' at the end of the ISBN number on the back cover. So make sure you accept no substitutes — an 'X' instead of a 'B' could set you well on the road to knitting your own padded cell.

HARDWARE

Commodore Talks To The People

The honeyed tones of the talking 64 rang out in London SW1 at the launch of Commodore's *Magic Voice* speech module. This tied in, rather fortuitously, with the first of a series of *Talking Books* packages. The module slips neatly into the cartridge port, but will also allow other cartridges to be stacked through a port of its own. It has a built-in vocabulary of 234 words, including the alphabet and numbers.

When *Your 64* rather ungenerously asked it to pronounce "Montevideo" it replied very promptly with "Syntax Error"; however it obligingly reiterated "Commodore — Is — Terrific" with barely a trace of transatlantic in its rendition. A diskette is promised that will extend its range allophonically.

Commodore is planning ar extensive range of talking educational software, all of which will have its own built-in vocabulary. The first of these are *Magic Garden* and *Magic Toolbox* which have been developed by a Cheltenham-based group of educationalists, each containing five stories to teach the very young child to read, write, and count. There's even one on its way entitled *Get Ready to Think!*

Magic Voice will be chattering away at your favourite stockist in late May and will cost in the region of £50. *Talking Books* will retail at £11.99 each and will be available on cassette or disk.

SENSORED!



Someone had to do it — design a joystick that looks nothing like a joystick at all! Suncom's Joysensor is a silver oblong box (a bit like a TV remote control unit) with a rockable disk at the bottom which you press in order to move all over the screen. Only problem is that the fire button is sited at the top — it takes a bit of practice to move and fire at the same time using both hands at once! The concept is a novel one and more aesthetically pleasing than a lot of joysticks around at the moment. And it's not a lot more expensive than its competitors at £29.95. More info from Consumer Electronics, Failsworth, Manchester M35 OHS.

BATTLE OF THE BUGS

Ever anxious to prove wrong the laws of probability, our highly optimistic editor took his 64 along to the zoo recently (no, this isn't an elephant joke) to see if a monkey could produce a usable computer program in something less than the expected 50 million years.

Who would believe it, our hairy anthropoid friend (Arthur) actually managed to knock-up something that looked sort of right in only half-an-hour. Unfortunately, we can't claim that probability has been entirely zonked because Arthur mucked up in a few places (figuratively speaking).

Still, *we* can sort that out, can't we? There doesn't seem an awful lot wrong and just a little humanoid tinkering here and there should do the trick. Those failing to get this laughable little listing to RUN properly will be able to bury their humiliation in the corrections, appearing in our next edition.

```
20 SC=0
30 PRINT"♥"
40 PRINT"ANSWER THE FOLLOWING QUESTIONS BY"
50 PRINT"PRESSING THE CORRESPONDING KEY"
60 PRINT
70 PRINT"PRESS ANY KEY TO START..."
80 GET A$:IF A$="" THEN 10
90 PRINT"♥"
100 PRINT"WHAT WOULD YOU DO WITH £1000"
110 PRINT
120 PRINT"  A) THE QUEEN"
130 PRINT
140 PRINT"  B) MAGGIE THATCHER"
150 PRINT
160 PRINT"  C) BARRY MANILOW'S AGENT"
170 GETA$:IFA$="" THEN170
180 IFA$="A"THENSC=SC+2
190 IFA$="B"THENSC=SC+3
200 IFB$="C"THENSC=SC+5
210 IFA$>"A"ORA$<"C"THEN170
220 PRINT"♥"
230 PRINT"WHAT DO YOU THINK OF SIR CLIVE SINCLAIR?"
240 PRINT
250 PRINT"  A) HE'S A SUCCESSFUL BUSINESSMAN."
260 PRINT
270 PRINT"  B) I TRY NOT TO."
280 PRINT
290 PRINT"  C) WHO?"
300 GETA$:IFA$="" THEN300
310 IFA$="A"THENSC=SC+3
320 IFA$="B"THENSC=SC+2
330 IFA$="C"THENSC=SC+4
340 IFA$<"A"ORA$>"C"THEN300
350 PRINT"♥"
360 PRINT"WHO DO YOU THINK IS IN CHARGE OF THE    COUNTRY?"
370 PRINT
380 PRINT"  A) INVEST IT"
390 PRINT
400 PRINT"  B) BLOW IT"
410 PRINT
420 PRINT"  C) BRIBE SOMEONE FROM COMMODORE INTO"
430 PRINT"     GIVING ME A COPY OF INTERNATIONAL"
440 PRINT"     FOOTBALL"
450 GETA$:IFA$="" THENGOSUB450
460 IFA=ATHENSC=SC+2
470 IFA=BTHENSC=SC+3
480 IFA=CTHENSC=SC+4
490 IFA$<"A"ORA$>"C"THENLIST450
500 PRINT"♥"
510 PRINT"DO YOU THINK THE BBC IS;"
520 PRINT
530 PRINT"  A) AN OVERATED AND EXPENSIVE MICRO"
540 PRINT
550 PRINT"  B) BETTER THAN ITV"
560 PRINT
570 PRINT"  C) GOOD FOR PROPING UP MY KITCHEN"
580 LOAD"     TABLE"
590 GETA$:IFA$="" THEN590
600 IFA$="X"THENSC=SC+3
610 IFA$="X"THENSC=SC+5
620 IFA$="X"THENSC=SC+4
630 IFA$<"A"ORA$>"C"THEN590
640 PRINT"♥"
650 IF SC<12 THEN 7500
660 IF SC>11 AND SC<15 THEN 800
670 PRINT"HEY, WOW.  WHAT ON EARTH ARE YOU DOING"
680 PRINT"WITH A COMPUTER?  IF FACT, YOU PROBABLY"
690 PRINT"DON'T REALISE YOU HAVE A COMPUTER, YOU"
700 PRINT"PROBABLY THINK THAT THE MACHINE AUNTIE"
710 PRINT"ETHEL GAVE YOU LAST CHRISTMAS IS A "
720 PRINT"BATTERY CHARGER, AND YOU WOULD HAVE "
730 PRINT"MUCH PREFERED A PAIR OF CARPET SLIPPERS."
740 END
750 PRINT"YOU MANAGED TO ANSWER EVERY QUESTION "
760 PRINT"SENSIBLY.  WHY ARE YOU READING THIS"
770 PRINT"WACKY MAG, WHEN YOU COULD BE WRITING"
780 PRINT"ANOTHER HOME FINANCE PROGRAM?"
790 END
800 PRINT"YOU'RE A PRETTY AVERAGE USER, YOU READ"
810 PRINT"TIME OUT, USE YOUR 64 ONCE A DAY AND"
820 PRINT"DRINK BRANDY AND COKE.  KEEP IT UP!"
830 PRINT"BY THE END OF THE WEEK YOU'RE SURE TO"
840 PRINT "BE DRUNK"
850 END
```

SOFTWARE

K-Tel Rocks Into 64 Software

Having made an encouraging foray into Spectrum software last December, K-Tel now has its sights firmly set on the 64. Already firmly embedded in your local softshop are *Cityattak, Odyssey* and "a bigger, better and meaner" upgrade of *It's Only Rock 'n' Roll* — previously a text-based strategy game for the Speccy. All games retail at £6.95.

So if you wanna be a rock 'n' roll star or save the city from certain oblivion, you know where to go, don't you?

SOFTWARE

Pyramid Game Drastically Cuts Loading Time

If you've had it up to here with falling asleep waiting for a cassette to load, then the painful pauses may soon be over. Maestro Minter himself came up with a 'turbo-loader' for his *Revenge of the Mutant Thingummybobs* some while back, but it wasn't guaranteed to work and certainly didn't deliver the Llamas on the office copy. And Anirog's recent 'turbo-loading' *Zodiac* has so far resisted all attempts to run what sounds like a nice outing for your joystick.

But Fantasy Software has now developed a 'supercharger' for its 64 version of *The Pyramid.* The game itself contains 120 chambers to explore on 15 different levels, each inhabited by one of 120 weird and exotic aliens. This goes a long way towards explaining a loading time of some thirty-odd minutes — and hence the need for some drastic action. The office copy certainly whizzed into orbit in just a paltry 6½ minutes, with the additional bonus of a title page to relieve the monotony of that all-too-familiar pale blue rectangle. Our eager eyes now turn to other software houses; will they rise to the challenge?

COMPETITION

£5000 To Be Won In International Art Challenge

There's still time, if you move quickly, to enter the Commodore International Computer Art Challenge. If you haven't yet heard, entries can be for either the VIC or the 64 and you can submit stills or moving artwork with a maximum run-time of 60 seconds.

Top prize in each of the four host countries — Britain, Germany, Canada and the US — will be a £5000 endowment to help the winner study computer graphics.

Entries fall into three age groups: under 12; 12 to 17; and 18 plus. In each of these categories there are big prizes of Commodore equipment to be won, and in addition, winners' work will go on show in a series of world-wide exhibitions.

The panel of judges includes Professor Brian Allison, President of the International Society for Education through Art; John Baxter, Commodore's UK Marketing Manager; Paul Brown, editor of *Page*, the Computer Arts Society



Llamasoft's Jeff Minter cranks up his camels.

journal; and artist Tony Hart, who is not entirely unconnected with Commodore's forthcoming *Art Master* package.

Of course, if you've ever tried to program in hi-res graphics on the VIC or the 64, it might be better at this late stage to get back to your box of multicoloured felt-tips. As it is, there's, er . . . well, *Simons's Basic*, if you're feeling flush.

Anyway, if you fancy yourself as a Hockney, a Disney, or even a mere Dali, start tickling those pixels; get your entry forms from: *The Commodore International Art Challenge, Granard Communications, 4 Babmaes Street, London SW1Y 6HD.*

BUSINESS

Microdeal Clamps Down On Rip-Off Merchants

Microdeal, whose *Space Shuttle* game for the 64 has been riding high in the charts, is hitting back hard at software piracy. Attached to a circular that it's sent out to magazines, is a photocopy of a letter from an altruistic customer in Southern Ireland whose name has been blanked out "to protect his anonymity".

Mr Anon's particular expose concerns a Dragon 32 Users' Group operating in Belfast. He writes: "The group is open to anyone and is a mail-order type one . . . The last list I saw showed that all your £8 programs were available at £1." The group is alleged to be masterminded by a reviewer from a well-known weekly publication and Microdeal has seen fit not to extend the protection of the Tippex bottle in his case. The name, address and telephone number of this "degenerate piece of scum" (the informant's words) are there for all to crucify.

Microdeal comments: "One way magazines can be of assistance would be to stop the user group lists in magazines before it is too late."

While we at *Y64* can only applaud all efforts made by industry to stamp out these rip-off merchants, it would surely be grossly unjust to penalise the many excellent and scrupulous user groups which have, after all, become the belt and braces of home computing and deserve all the publicity they can get.

We are not at present publishing any such listings in *Y64*, but if (or when) we do, then we trust that you the readers will inform us of any skullduggery and bootleggery you come across. Let battle commence!

SOFTWARE

Mastertronic Slash Prices As War Hots Up

Another new software house, Mastertronic, seems bent on continuing the price blitz triggered off by Imagine. Its first 14 titles, including eight for the 64 and two for the VIC, are about to hit supermarkets, garages, hi-fi dealers and video libraries, the strategy being to encourage impulse buying.

Said director Martin Alper: "We will endeavour to prove what the market has long believed — that software currently available is generally overpriced. We want to encourage the use of the computer in the family and believe that bringing the price of software down to children's pocket money level will achieve this."

As *Y64* goes to press we have yet to sample any of the goodies. However the cassette innards have a nice line in artistic understatement which certain other software houses might well examine to their profit.

Titles so far released include *Duck Shoot, Space Walk, Jungle Story, Munch Mania* (sounds familiar), and one clearly aimed at tickling the jaded palates of the pension book set — *Bionic Granny.*

EDUCATION

Offensives To Tempt Educational Fraternity

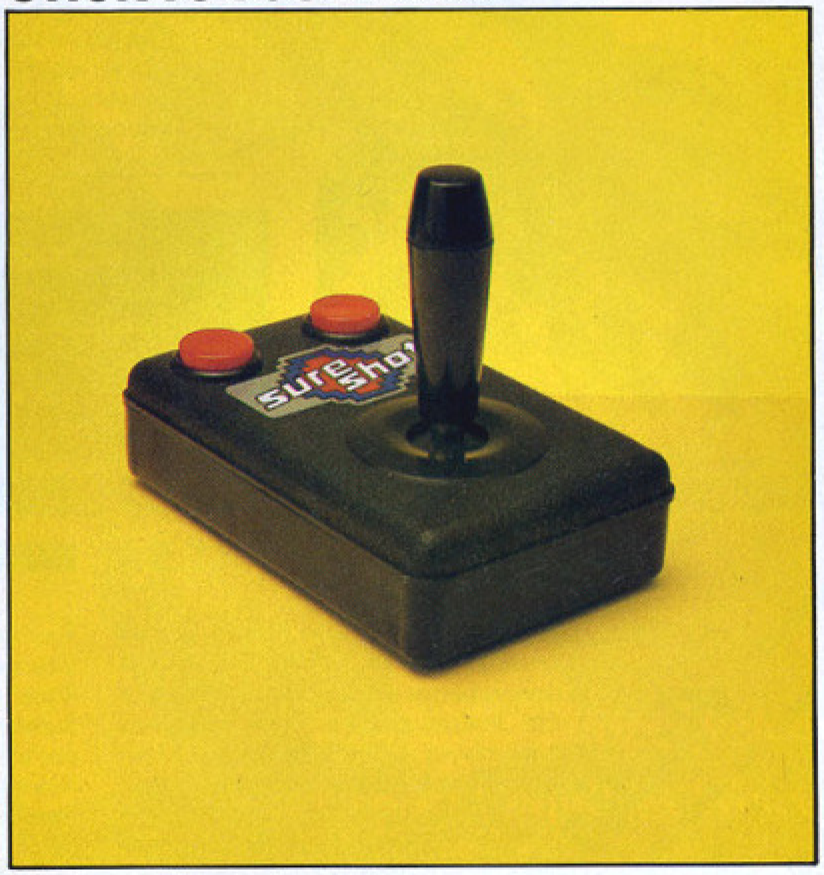
With the end of the Government-assisted purchase scheme for secondary schools in sight, it's interesting to note that Atari and Commodore both launched guerrilla-type

THE WORD IS OUT



Originally designed for the VIC 20, the Adman Speech Synthesiser cartridge is now available for the CBM 64. Claiming an infinite vocabulary, this is achieved by employing over 60 allophones (small segments of speech) which, via a number of software routines incorporated in EPROM, can be built up into individual words and, ultimately, sentences. Successful operation can be checked in seconds and you should then be able to voice the keys; the more enthusiastic among you will have no difficulty impressing your friends by adding the power of speech to your own games. Details on the cartridge can be obtained from Adman Electronics, Ripon Way, Harrowgate, North Yorkshire HG1 2AU.

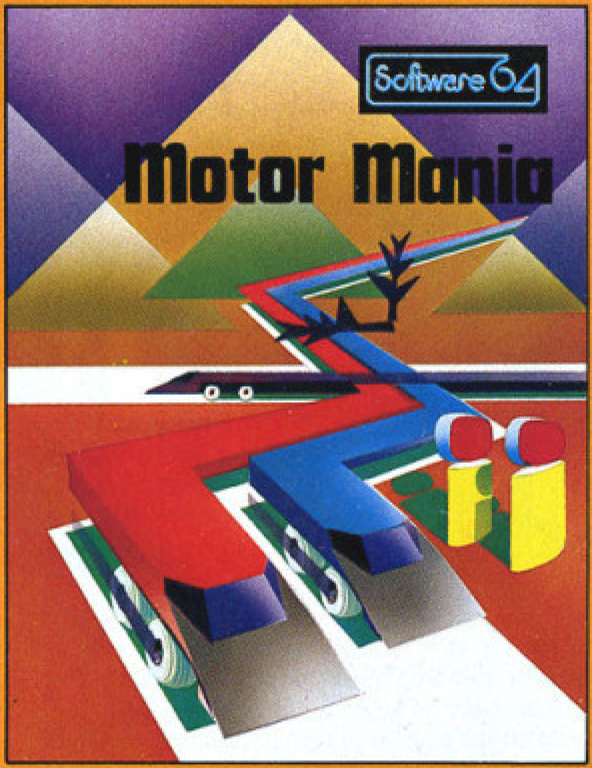
STICK TO YOUR GUNS



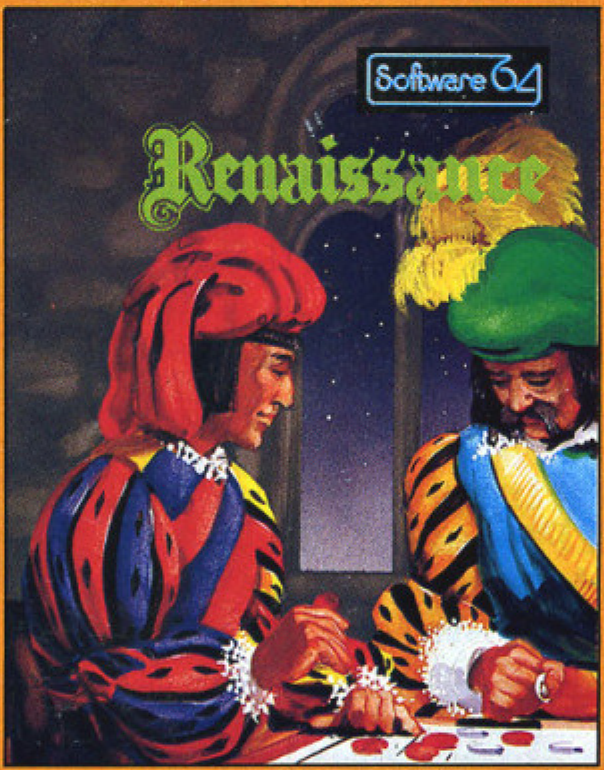
Based on a design that has proved so successful in the high street arcades, Cookridge Computer Supplies is confident that the Sure Shot joystick will be a winner. Complete with a rigid steel chasis, the device is housed in good ol' ABS plastic — so it should stand up to those frustrating moments when you fail to reach the final level of your favourite game and chuck the thing at the nearest wall! The device is priced at £15.95, and if you want the matching programmable interface it'll cost you extra. Mail order enquiries should be addressed to Cookridge Computer Supplies, PO Box 1W9, Leeds LS1 6NT — or phone 0532 670625.

MACHINE CODE GAMES ACTION FOR THE 64

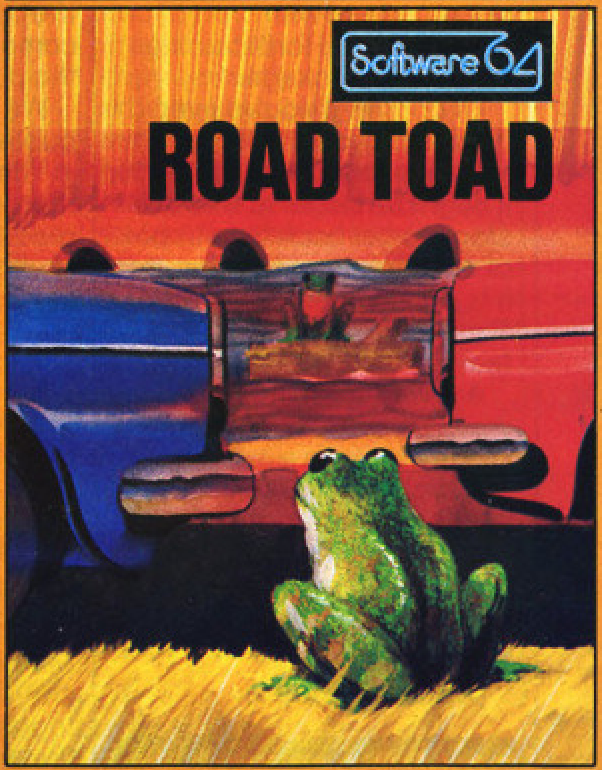
Software 64



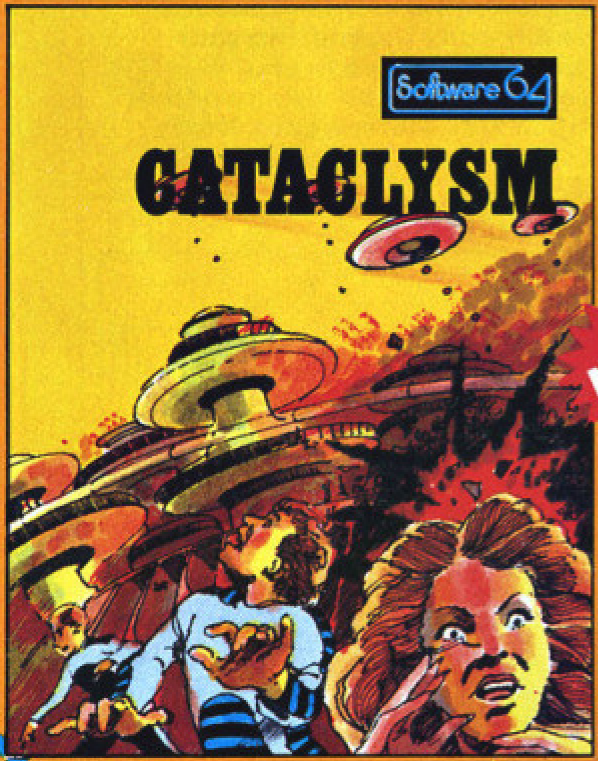
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NEW

WORD FEUD £7.95

This brilliantly conceived program combines the best parts of arcade games with the best of educational games, making a real family game that anyone who can see the screen can participate in. You have to find the word that is hidden twice in the jumble of letters, then guide your sights over one of the occurrences of it.

The first to find it wins! You can play by yourself or in teams against the computer, or against other players. Three difficulty levels are included to suit young and old alike!





BONZO 64 £7.95

This best-selling game for the VIC-20 is now available on the 64! Featuring the most intelligent and devious monsters you have ever tried to avoid, the Bonzos, this game is a real joystick wrencher. Move Hans, the handyman, up and down the ladders to pick up the boxes from the different levels.
But don't meet a Bonzo on the way!

NEW

CATACLYSM £5.95

Pure shoot-em-up arcade action for the 64 and unexpanded VIC! The Lunar city of Erriam is under attack from the ships of the Jovian empire. Their merciless bombing will reduce your city to a pile of rubble, unless you can hold them off. You are the commander of the sole laser defence base. Your mission - hold out for as long as possible.

BURNIN' RUBBER

You are an entrant in the great Intergalactic Four Seasons Death Race!. You must tackle the Spring, Summer, Autumn and Winter sections with the objective of running as many other cars as possible off the road. The opposition is numerous, including the indestructable but slow Tank Cars, the tricky Deathmobiles and many other Demon Drivers. You have one advantage - your car can fly for a limited distance, allowing you to avoid hazards if you're quick enough! All this and more makes Burnin' Rubber the car race of the century!



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☐ Details of Other Games (Please tick)
I enclose my cheque/P.O. for £ ....
NAME ....
ADDRESS ....
Tel (DAY)
Tel (EVE)

offensives into the education arena. In these heady days of the Great Logo Love Affair, it was perhaps to be expected that both companies should come forward dangling that fertile little turtle as tasty bait for the tots. Atari's version of *Turtlemania* has certainly had its share of praise from the educational fraternity and its deal is based around the 600XL together with Logo cartridge, two 200-page manuals and reference guide — all for the princely sum of £175 (ex VAT).

Commodore, on the other hand, no doubt still gloating over its award of a Royal Warrant, was offering the 64 with single disk drive, plus its own MIT-based Logo, *and Simons' Basic* — all at the knock-down price of £299.00 (ex VAT). Unfortunately, this snip only lasted until 30 April, prompting some cynics to suggest that maybe the Big C was clearing a little shelf space to make room for the launch of a new (16-bit?) machine. Just wild conjecture, of course.

GAMES

Temperatures Rise With Red Hot Poker Game

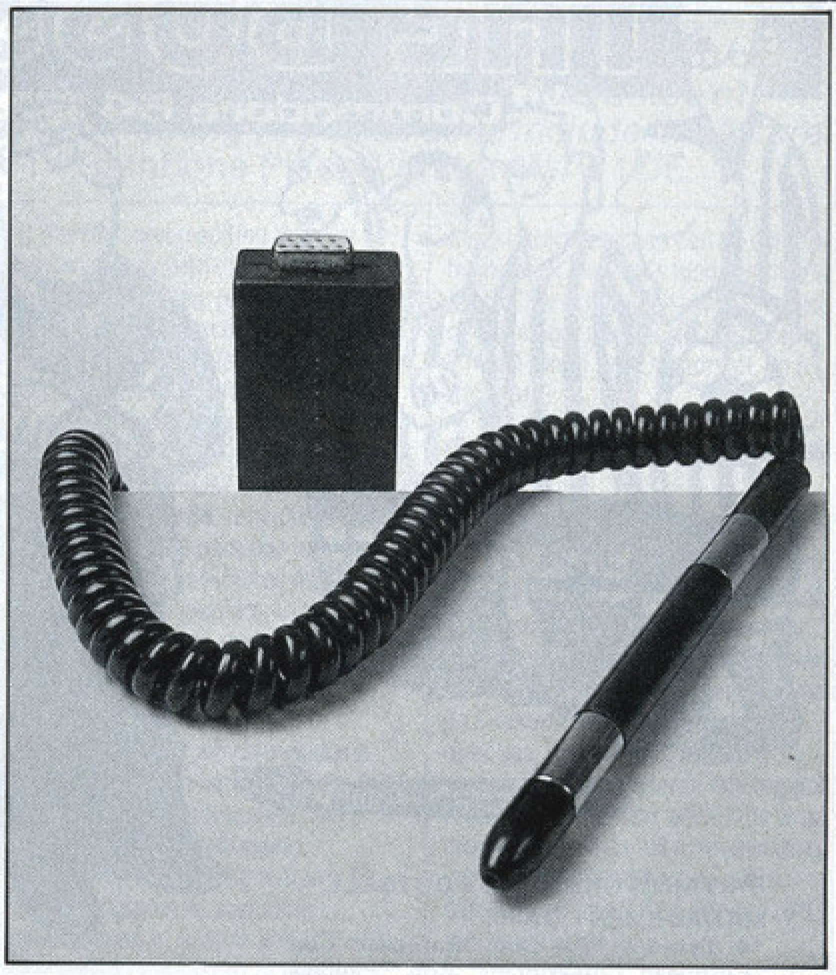
That infamous program for the Atari, *Strip Poker*, has now been unzipped in all its glory for the 64. With two "captivating opponents", you too can experience "the heady delights of Suzi or Melissa" in the privacy of your own back parlour. And just in case you find the whole concept sickeningly sexist, Allrian — the one and only perpetrator of this latest assault on all that's good and decent in home computing — are making a data disk available with two *male* opponents to boot.

Strip Poker is available on cassette for £7.99, or disk at £12.45 from your favourite Soho — er — software emporium. We at *Y64* prefer to remain poker-faced about the whole package — that is, until we've laid hands on a review copy and had a chance to launder our smalls. Meanwhile, the same company's more ideologically sound *Monkey Maths* may well prove to be a "useful stimulant" to your child's numeric education.

LIGHT FANTASTIC

There are always alternatives to using the keyboard or a joystick to play games on your Commodore — or so claim Stack who offer either the Light Rifle or Light Pen to add interest to your entertainment. The Light Pen is going to appeal to people who like to use a small delicate object, but the same can't be said of the Light Rifle! Though very light in weight, it's about three quarters the size of a real rifle with telescopic-style viewfinder and looks pretty authentic.

The Light Rifle will set you back £29.95 and the Light Pen £28.75. You can either buy them mail order from Stack Computer Services Ltd, 290-298 Derby Road, Bootle, Merseyside (telephone 051-933 5511) or through WH Smith, Menzies, Boots and others.



PUZZLEPOINT

Several centuries ago a German mathematician, Johan Daniel Titius, observed a pattern in the size of the planet's orbits. If the Earth's orbit is taken as being 10 units from the sun, then the distances of the other planets can be approximated by the following formula, which he devised:

<distance> = 3 * (2A (<planet-number> − 2)) + 4

(where 'A' denotes exponentiation, i.e. 'A' means 2 multiplied by itself N times).

At the time the formula appeared more impressive than it does today, since (a) he 'fudged' it to improve the Mercury result, and (b) Neptune and Pluto had yet to be discovered.

This leads us into our first problem ... which is to find a more up-to-date formula that's reasonably simple, fits all nine planets, and without fudging! This is a unique opportunity to get your name in the history books. The above formula has come to be known as the Titius-Bode law, Bode being the first to publicise it. Not only will the three winning readers become known to posterity as the architects of the Tyche-Bode laws, but they will also receive a £10 book token for their trouble.

RULES

1. Your formula can contain up to *nine* symbols from: +, −, *, /, A, COS(...), SIN(...), TAN (...), PI (i.e. 3.1415926), N (the planet number 1 to 10), and the integers −9 to 9 inclusive. SIN, COS and TAN are assumed to work with radians and you can use as many parentheses as you like. For example: The Titius-Bode formula uses nine of the above symbols, (COS (N + PI) + N uses six, and so on.
2. The best formula will be the one producing the least total percentage error for the 'ten' planets. Ignore the error for the 'fifth' planet (the asteroids). Each percentage error is then calculated as 100 times the *magnitude* of the error divided by the true distance. The true distances tabulated above are actually the mean orbital distances of the planets, with the Earth's distance being 10 units, by definition.
3. Please write the total percentage error on the back of the envelope.
4. No cassettes or disks — solutions on paper only. All material sent will be retained and may be reprinted without permission.

Finally all entries must arrive by June 29. Address them to: *Puzzlepoint 1, Your 64, 14 Rathbone Place, London W1P 1DE.*

The formula produces the following results:

PLANET	NUMBER	FORMULA PREDICTED DISTANCE	ACTUAL MEAN DISTANCE	MAGNITUDE PERCENTAGE ERROR
Mercury	1	5.50	3.87	42.12
Venus	2	7.00	7.23	3.18
Earth	3	10.00	10.00	.00
Mars	4	16.00	15.24	4.99
Asteroids	5	28.00		.00
Jupiter	6	52.00	52.03	.06
Saturn	7	100.00	95.39	4.83
Uranus	8	196.00	191.80	2.19
Neptune	9	388.00	300.60	29.08
Pluto	10	772.00	394.40	95.74
TOTAL PERCENTAGE ERROR ...				182.18

This is Your 64's collection point for new packages we've heard about over the past month or so. They're mostly unseen and untested, so don't take inclusion as any kind of guarantee of usefulness — or availability for that matter. If you've something you'd like us to include in a future issue, send details to: Soft Stack, Your 64, 14 Rathbone Place, London W1P 1DE.

BUSINESS

Purchase Ledger '64 is designed for the non-technical user, and operates in plain English. It maintains a comprehensive file of suppliers' accounts, and allows invoice payments and debit notes to be posted to each one. Other features includes a wide variety of reports as well as analyses of purchases. £75 from Anagram Systems, on 0403 59551.

Sales Ledger has been specially tailored for the **64** from a program designed for the larger Commodore machines. Customer account files are maintained on disk using names instead of numbers, with paid invoices being deleted monthly, and outstanding accounts remaining on file until cleared. In addition, invoices, payments and credit notes can be posted to each account, with sales ledger invoices printed, as well as credit notes and statements. The package sells for £75, and can be obtained from Anagram Systems on 0403 59551.

CUDA 64 has been adapted from **SM-CUDA**, a powerful name and address database system that's widely used on the **Commodore 8000** series. it's essentially an electronic card index where records can be looked up sequentially, or by searching either forwards or backwards from any given point. Each disk can hold in excess of 600 records, containing such information as record number, search name, personal name, organisation name, four lines of address, telephone and telex number, and several lines of notes. £40 from SM Software (UK) Ltd, on 0453 46065.

EDUCATION

Look Sharp is designed to test and train children's powers of observation in an amusing way. There are two programs on this tape, the first of which finds the player down on the farm, sorting out the sheep from the geese, the cows from the pigs. The second tests the player's suitability as a space observer. The **64** version is currently in preparation and will retail for £7.95. Further information from Mirrorsoft on 01-822 3800.

GAMES

Aztec Challenge is a 3D graphics adventure where the player takes on the role of a warrior who has been selected for human sacrifice. His only chance of survival is to complete an obstacle and endurance course of skill and daring within the ancient pyramid of Tenochtitlan. priced at £12.95 (disk) and £8.95 (tape), the program can be obtained from Audiogenic on 01-290 6044.

Dinky Doo finds the player having a nightmare, brought on by eating that fatal cheese sandwich before going to bed. Still, all you have to do to get back to normal is reach for your glass of milk. But it's not that simple because you have to allow for skulls, evil snakes, electrified walls and any number of other unmentionable nasties. For £7.95, the program can be obtained on tape from Software Projects, on 051-428 7990.

Troopa Truck is a highly manoeuvrable multi-terrain amphibious armoured patrol wagon, designed especially for the planet Zon. The player's job is to control the craft while trying to save Earth's peaceful scientific patrol. Available on cassette from Rabbit Software for £5.99. Telephone 01-863 0833.

Turbo is reported to be an extremely high quality 'drive' game that relies heavily upon a full 3D display, and which emulates computerised simulators similar to those used in professional driving schools. It's supplied on cassette for £4.99 and is available from Oxford Computer Systems, on 0993 812700.

UTILITIES

Turbo is an extended Basic that offers an extra 45 instructions to help improve the **64's** usefulness. It is cassette-based and costs £14.95 from Aztec Software, on 0924 492826.

Mae 64 is a comprehensive software development system for **64** assembler programmers; it's not really suitable for use by beginners because a good knowledge of 6502 assembler language is a necessary pre-requisite. It permits rapid development of 6502 syntax software, and includes a source editor which features over 25 commands. It's available at a cost of £40 on disk from SM Software on 0453 45065.

A variety of cross-compilers from the **Commodore 700** and **64** have been announced by Oxford Computer Systems. The four compilers all have the ability to compile source or generate object code on the **8000** series for use on the **Commodore 700/B-128** and **64** machines. The compilers for the **700** cost £450 each and those for the **64**, £125. Details Oxford Computer Systems, 0993 812700.

Simply Assemble is an assembler package for the **64** and **PET** machines. It has full screen editing and can automatically turn the assembler listing into a Basic program with machine code attached. It also has error checking and labelling disassembler facilities. Costing £22, it comes from Simple Software, on 0273 504879.

BC Basic, a 9K ROM extension cartridge for the **64**, provides a 97-command toolkit package for programmers. Its features includes hi-res, sprites, text graphics, UDGs, sound, machine code aids, structured programming and I/O. £57.50 from Kuma Computers, 07357 4335.

Kit 64 is a toolkit which includes a host of programming aids. These fall into one of three categories. The B Facility provides debugging, structuring and testing features for Basic programs — including renumbering of GOTOs and GOSUBs, and with a cross-index of new and old line numbers, TRACE, FIND, DUMP, and so on. The M Facility assists the programmer in writing error-free assembler programs with its built-in error detection and display features. Finally, the F Facility allows the programmer to look directly at what's going on in the disk drive, and examine and change any block. Available on disk from SM Software (UK) Ltd, on 0453 46065. Price £40.

ISM 64 is an index sequential disk manager, containing a collection of extra Basic commands that form a complete disk file management system. It relieves the programmer of the need to produce complex subroutines that are often needed for maintainance of sorted, indexed data files. £40 from SM Software (UK) Ltd on 0453 46065.

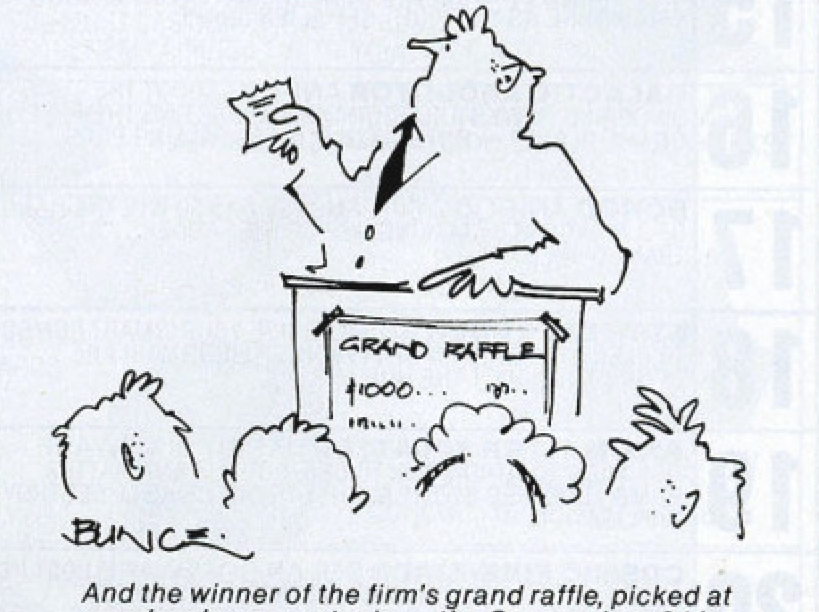
Go-Sprite is a versatile sprite editor which makes full use of the extensive MOB facilities provided on the **64**; all the program facilities can be operated by joystick alone. It's also possible to control the program via the keyboard, or by using a light-pen. £9.95 (tape) £11.95 (disk) from Mirrorsoft, on 01-822 3800.

WORD PROCESSING

Text 64 provides word processing of the same quality as the larger SM-TEXT produced by the same company for the **800** series. Its features include 110-column width, scrolling in any direction, mulitiple file handling on screen, extensive search and replace facilities, justification, automatic wrap-around, as well as full screen editing, including text insertion. Available on disk for £50 from SM Software (UK) Ltd, on 0453 46065.

Wordcraft 40 is a word processor for the **64** that's written in 100 per cent machine code and takes advantage of the larger screen format to give better readability. Other features include full text editing and manipulation, a scrolling screen display, storage on either tape or disk and compatibility with CBM, parallel Centronics and RS232C serial printers. £89.95, from Audiogenic Ltd, on 0734 595647.

Telemod 2 is a new modem which interfaces with many popular home micros, including the **64**. It comes equipped with a connector to fit the new British Telecom extension socket. Appropriate hardware interfaces which will link you up with Prestel, Micronet 800 and other viewdata service are available at an extra charge. The modem itself costs £84 and full details are available from OE Ltd, North Point, Gilwilly Industrial Estate, Penrith, Cumbria, telephone 0768 66748 ■



And the winner of the firm's grand raffle, picked at random by computer is . . . the Commodore 64 in Accounts?!

VIC TWENTY

1	**GRIDRUNNER** LLAMASOFT CENTIPEDE-TYPE GAME WHICH INCLUDES TWO GUNS: ONE AT THE BOTTOM AND ANOTHER AT THE SIDE. WATCH OUT FOR THE PODS, THEY TURN INTO BOMBS.
2	**BEWITCHED** IMAGINE PACMAN-STYLE GAME WHERE THE PLAYER MOVES AROUND A MAZE PICKING UP KEYS TO OPEN UP DOORS AND PROGRESS TO THE NEXT LEVEL.
3	**WACKY WAITERS** IMAGINE HELP THE WAITER ACROSS THE HOTEL TO THE CUSTOMER, VIA THE LIFTS — THEN BACK AGAIN TO GET THE WINE.
4	**PARATROOPER** RABBIT SOFTWARE SHOOT THE PARATROOPERS AS THEY DROP FROM ATTACKING PLANES AND TRY TO LAND NEAR YOUR POSITION AT THE CENTRE OF THE SCREEN.
5	**KRAZY KONG** INTERCEPTOR SOFTWARE HELP MARIO GET TO THE TOP OF THE STEEL FORTRESS AND RESCUE HIS GIRLFRIEND — BUT WATCH OUT FOR THE FALLING BARRELS.
6	**THE WIZARD AND THE PRINCESS** MELBOURNE HOUSE FIND THE EVIL WIZARD'S CASTLE, FIGHT THE DRAGON AND SLAY THE TROLL BEFORE RESCUING THE PRINCESS.
7	**SUPERVADERS-BOMBER RUN** K-TEL SHOOT THE INVADING SUPERVADERS IN THE FIRST, AND FLY A BOMBER IN THE SECOND HALF OF THIS DOUBLE-SIDED CASSETTE.
8	**SKY HAWK** QUICKSILVA PLENTY OF BOMB DROPPING IN THIS GAME WITH A WW2 SCENARIO, AND GOOD GRAPHICAL REPRESENTATION OF FRENCH LANDSCAPES.
9	**SNOOKER** VISIONS A GCOD, IF RATHER SLOW, SIMULATION OF THE REAL THING.
10	**COSMONAUTS** MELBOURNE HOUSE THE PLAYER IS A COSMONAUT WHO MUST FREE HIS SPACECRAFT FROM A TRACTOR-BEAM ON A BARREN PLANET — AND AVOID ELECTROCUTION.
11	**ANOTHER VIC IN THE WALL** BUG-BYTE ANOTHER BREAKOUT GAME WHERE THE PLAYER KNOCKS DOWN A WALL, BRICK BY BRICK.
12	**ARCADIA** IMAGINE CONTROL THE STARSHIP ARCADIA AND REPEL THE ATARIAN HOARDS BY SUBTLE USE OF YOUR PLASMA DISRUPTOR GUNS.
13	**SKRAMBLE** ANIROG SIX-STAGE ARCADE GAME WHERE THE PLAYER HAS TO AVOID HIGH-RISE BUILDINGS AND DESTROY THE ENEMY BASE.
14	**STARSHIP ESCAPE** SUMLOCK YOUR SPACESHIP HAS EXPLODED, AND YOUR DEMANDING JOB IS TO COLLECT THE FRAGMENTS AND SCREW IT BACK TOGETHER AGAIN, BEFORE ESCAPING.
15	**CYCLONS** RABBIT SOFTWARE A GAME THAT'S NOT ONLY BASED ON 'STAR WARS', BUT ALSO PLAYS THE 'STAR WARS' TUNE AS YOU FIGHT OFF ALIEN CRAFT.
16	**GALACTIC ABDUCTOR** ANIROG SHOOT THE SWOOPING HAWKS AND STOP THEM ABDUCTING THE PEOPLE ON THE PLANET — BUT WATCH OUT FOR FALLING EGGS.
17	**BONGO** ANIROG A SUPERMOUSE HAS TO WIN THE HAND OF A PRINCESS BY MAKING USE OF THE LADDERS AND TRAMPOLINES.
18	**STAR DEFENDER** ANIROG USE YOUR 'SMART BOMBS' TO CLEAR THE SCREEN OF INVADING ALIENS WHO ARE TRYING TO ABDUCT THE HUMANS.
19	**ANTIMATTER SPLATTER** RABBIT SOFTWARE USE YOUR POSITRON GUN TO DESTROY THE ANTIMATTER BOMBS DROPPED BY THE MIGHTY TRAAL, OR HE'LL DESTROY CIVILISATION.
20	**COSMIC FIRE-BIRDS** SOLAR SOFTWARE LOST IN DEEP SPACE, YOUR JOB IS TO DESTROY THE WINGED CREATURES WHO ARE KNOWN AS COSMIC FIRE-BIRDS.

YOUR OWN CHOICE CHARTS

This issue's charts reflect the enthusiasms (or otherwise) of the *Y64* staffers; everyone on the mag was leaned on to vote for his/her favourite games of the moment, and a few moments of nifty micro magic has produced these top-20 results.

Naturally we've no intention of boring everyone silly with *our* moronic tastes, issue after issue. No, the editor insists that as soon as possible the charts should reflect *your* moronic tastes. To do that of course we need plenty of feedback from readers (not to mention a vastly expanded database program to handle the whole thing!)

And that's why we'd like all of you to write in with your top five selection for either the 64 or VIC 20 (or both). Cast out all charts of doubtful origin! Between us we will be able to give an accurate picture of the games *you* really rate at the present time.

POLLING POINTS

Just fill in the ballot form on this page, and in the process (bribe, bribe) you may just get to receive a clutch of brand new software. That's because, every issue, we'll be pulling a voting slip out of the proverbial hat and presenting its sender with a selection of the latest goodies.

Forms returned by the end of May will influence the charts in our second issue; later arrivals will be used in subsequent editions. Whatever you do, don't stop sending them in!

Y64 TOP 20 READERS POLL

My top five games for the **Commodore 64** are:

1

2

3

4

5

My top five games for the **VIC 20** are:

1

2

3

4

5

Name

Address

Send this form off today to:
Your 64 Top 20
14, Rathbone Place
London W1P 1DE

your 64

(or a photocopy should you not want to spoil your issue).

YOUR 64'S TOP TWENTY

1	**INTERNATIONAL FOOTBALL**	COMMODORE	REAL TIME FOOTBALL GAME, INCLUDING VERY IMPRESSIVE ANIMATION AND GREAT SOUND.
2	**FORBIDDEN FOREST**	AUDIOGENIC	A HUGE AND VERY COMPLEX MULTI-LEVEL ARCADE ADVENTURE GAME, BASED IN A FANTASY FOREST.
3	**REVENGE OF THE MUTANT CAMELS**	LLAMASOFT	LASER SPITTING CAMELS FIGHT AGAINST VARIOUS ODDITIES, INCLUDING UMBRELLAS AND CND SYMBOLS.
4	**MANIC MINER**	SOFTWARE PROJECTS	A TWENTY-LEVEL GAME THAT HAS YOU TAKING ON THE ROLE OF MINER WILLY, COLLECTING OBJECTS AROUND EACH SCREEN.
5	**BUGABOO**	QUICKSILVA	SUPERB GRAPHICAL CARTOON-TYPE GAME INVOLVING YOU (THE FLEA) AND A LARGE DRAGON-TYPE MONSTER
6	**MOTHERSHIP**	ARTIC	'STAR WARS' TYPE GAME WHERE THE PLAYER FLYS HIS SHIP THROUGH A TRENCH, GUARDING THE CRAFT FROM ALIEN ATTACK
7	**CHINESE JUGGLER**	OCEAN SOFTWARE	A RE-RUN OF THE ORIGINAL HUNGARIAN PLATE-SPINNING IDEA WHERE THE PLAYER HAS TO KEEP 'EM WHIRLING.
8	**KRYSTALS OF ZONG**	PSS	COLLECT KEYS AS YOU TRAVEL AROUND THE MAZES IN A PACMAN-STYLE ARCADE ADVENTURE.
9	**THE HOBBIT**	MELBOURNE HOUSE	A VERY POPULAR GRAPHIC ADVENTURE, BASED AROUND TOLKEIN'S BOOK
10	**SIREN CITY**	INTERCEPTOR SOFTWARE	YOU'RE A NEW YORK COP DRIVING A 'BLACK AND WHITE' AROUND THE CITY. THE AIM IS TO CATCH THE VILLIANS.
11	**BLAGGER**	ALLIGATA	HELP THE CROOK PROGRESS THROUGH 30 SCREENS, COLLECTING KEYS AS HE GOES, IN ORDER TO RETURN TO THE SAFE AND THEN OPEN IT.
12	**GRANDMASTER CHESS**	AUDIOGENIC	COMPLETE, FAST, BUT USER-FRIENDLY CHESS GAME WITH NINE LEVELS
13	**EXTERMINATOR**	BUBBLE BUS	FAST AND SMOOTH VERSION OF CENTIPEDE, WITH A LOT OF EXTRA BADDIES.
14	**MOTOR MANIA**	AUDIOGENIC	MILEAGE COUNTS IN THIS TOP VIEW DRIVING CHALLENGE WHERE SURVIVAL IS THE NAME OF THE GAME.
15	**FALCON PATROL**	VIRGIN GAMES	AS SOLE SURVIVOR OF THE FALCON PATROL, YOU MUST DESTROY THE ATTACKING ENEMY AIRCRAFT WITH YOUR VTOL JET.
16	**SCUBA DIVE**	DURELL SOFTWARE	COLLECT AS MUCH TREASURE AS YOU CAN FROM THE WATERY DEPTHS, AVOIDING THE CLAMS, SHARKS, OCTOPUSES, ETC.
17	**SPACE SHUTTLE**	MICRODEAL	LEARN TO TAKE-OFF, ORBIT, DOCK, RE-ENTER AND LAND YOUR SPACECRAFT.
18	**HUNCHBACK**	OCEAN	ASSIST QUASIMODO TO RESCUE THE BEAUTIFUL ESMERELDA, WHILE AVOIDING THE GUARDS WHO INSIST ON STICKING SPEARS IN HIM.
19	**MR WIMPY**	OCEAN	AVOID THE BURGER THIEF AS YOU COLLECT THE INGREDIENTS TO CONCOCT 'DELICIOUS' BURGERS.
20	**MEGAWARZ**	PARAMOUNT	FIGHT THE INVADING ALIENS AS THEY INVADE EARTH FROM WAY OUT IN THE SOLAR SYSTEM, THEN RETURN HOME.

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FIRING-UP BASIC

The Neanderthal version of Basic you were lumbered with when you first got your 64 has been a major cause of frustration. Without recourse to additional software, high-resolution routines can be a long, slow agony. Relief is now at hand from Phil Cornes *and* Tony Cross *who break down the barriers with this machine code listing for adding guts to your Basic — with nine essential commands.*

The routines have been written so that they form an extension to the resident CBM Basic and they are called by using their own keywords. Parameters are passed to these new keyword routines in normal Basic integer variables — which makes the routines much more friendly and easy to use.

The New Keywords

The Hex dump contains nine new Basic keywords, each of which is prefixed with the @ symbol. (The @ symbol forms part of the keyword and must not be left out.) They are:

@OLD restores a program which has been accidentally NEW'd. If @OLD is used when there is no program in memory (for example on switch on) then its action is indeterminate.

@MOVEBAS moves the bottom of the Basic program text area from address 2048 decimal up to address 16348 decimal. This protects the high resolution screen and frees space for 32 sprites. Any program which is in memory will be lost and so @MOVEBAS prints a SURE? message before it moves the memory. A reply of Y will cause the bottom of Basic to be moved. A reply of N (or anything except Y) will abort the command.

@HRG locates the high resolution screen at address 8192 decimal and switches to high resolution mode.

@LRG switches to low resolution (normal text) mode.

@GCLEAR clears the high resolution screen (provided it's located at address 8192 decimal).

@GCOL sets up the foreground and background drawing colours on the high resolution screen. The foreground colour is read from the Basic integer variable FC% and the background colour is read from BC%. If either FC% or BC% does not exist then normal text mode is entered and a SYNTAX ERROR message is printed. FC% and BC% are not checked for range, but only the low 4 bits of each variable are significant (numbers in the range 0 to 15).

@STYLE sets up the drawing style which will be used for @PLOT and @LINE. The value of style is read from the Basic integer variable S%. If S% is 0 then replace style is used. This means that a dot will be plotted or a line will be drawn regardless of the exisitng state of these dots on the screen. If S% is 1 then exclusive or style is used. This means that before a dot is plotted or a line is drawn, the existing state of the dots (1 to 0) is exclusive OR'd with 1 to give the value which will be written.

For example, a dot which is plotted in exclusive or style will erase an existing dot at the same point or, if the dot is not already lit, it will light it.

If S% does not exist then normal mode is entered and a SYNTAX ERROR message is printed. If the value in S% is not 0 or 1 then normal mode is entered and an ILLEGAL QUANTITY ERROR message is printed.

@PLOT plots a point on the screen using the existing value of style. The X coordinate to be plotted is read from the Basic integer variable X% and the Y coordinate is read from Y%. The system variables LASTX and LASTY are set to the values in X% and Y% (see @LINE). If either X% or Y% does not exist then normal text mode is entered and a SYNTAX ERROR message is printed. If either X% or Y% is off screen then the point will not be plotted.

@LINE draws a line from the point in the system variables LASTX and LASTY (see @PLOT) to the point specified in the Basic integer variables X% and Y%. The system variables LASTX and LASTY are then set to the values in X% and Y%. If either X% or Y% does not exist then normal text mode is entered and a SYNTAX ERROR message is printed. If a line goes off screen, then that part of the line which is on screen may or may not be drawn, depending on how far off screen it goes. Lines which are wholly on screen will always be drawn, so the rule is don't try to draw lines which go off screen!

All these commands can be used in either direct mode, or in program lines (either single or multi-statement). If they are used in direct mode, however, the new keyword must be the first statement on the line or a SYNTAX ERROR will result.

About The Hex Dump

Once you've typed everything in, you can save it by entering and RUNing the following program: ▶

MACHINE CODE LOADER

Before attempting to load the Hex dump, you will need to enter the listing below which will allow you to modify the contents of selected memory areas.

When you have entered and RUN it, you will get the message "Enter Start Address (Hex)". You should then respond with the start address — in this case C000. Type in the new values in Hex and press Return. After all modifications have been made, type a capital X and press Return again. This gets you back to the "Enter Start Address" message, and another X will terminate the program.

If you don't feel up to typing in the listing, you'll be pleased to know it's available on cassette at £4.95, direct from General Software, PO Box 15, Stone, Staffs ST15 0SE. It comes with additional documentation to help you add your own keywords and extend Basic even further.

```
10 INPUT "ENTER START ADDRESS (HEX)"
   ;H$
20 IF H$="X" THEN END
30 GOSUB 2000 : K=D-1
40 K=K+1 : D=K : GOSUB 1000
50 PRINT H$;"  ";
60 D=PEEK(K) : GOSUB 1000
70 PRINT RIGHT$(H$,2);"  ";
80 H$="" : INPUT H$
90 IF H$="X" THEN 10
100 IF H$="" THEN 40
110 GOSUB 2000
120 POKE K,D
130 GOTO 40
1000 H$="" : FOR C=4 TO 1 STEP -1
1010 T=INT(D/16↑(C-1))-INT(D/16↑C)
     *16
1020 IF T>9 THEN 1040
1030 H$=H$+CHR$(T+48) : GOTO 1050
1040 H$=H$+CHR$(T+55)
1050 NEXT C : RETURN
2000 D=0 : FOR C=1 TO LEN(H$)
2010 D=D*16
2020 IF MID$(H$,C,1)>"9" THEN 2040
2030 D=D+ASC(MID$(H$,C,1))-48 :
     GOTO 2050
2040 D=D+ASC(MID$(H$,C,1))-55
2050 NEXT C : RETURN
```

FIRING-UP BASIC


```
10 PRINT "(clr/home)"
20 FOR X=0 TO 1952 STEP 6 : PRINT X+100;
   "DATA";
30 FOR Y=0 TO 5 : Z=PEEK (49152+X+Y)
40 PRINT MID$ (STR$(z), 2); ",";
50 NEXT Y : PRINT CHR$(20)
60 NEXT X : END
```

This will print lines of DATA statements on the screen. You can then simply place the cursor on each line in turn and enter it as though you had typed it yourself. When you have entered each DATA line, change the first 6 lines of the program to the following lines:

```
10 REM THIS LOADS THE EXTENDED BASIC
   KEYWORDS
20 FOR X=0 TO 1952
30 READ Z
40 POKE 49152+X, Z
50 NEXT X
60 END
```

You now have a Basic program which, when RUN, will POKE the new keyword routines in for you. This program can be SAVEd to tape or disk under any name you like.

Before the new keywords can be used they must be linked in to the resident Basic interpreter. This is done by typing SYS 49800, and you'll see the following message on the screen:

```
****CBM 64 EXTENDED BASIC****
(C) AL CROSS 1983 * 64K RAM SYSTEM READY
```

The new keywords are now ready for use.

Finally, note that pressing RUN/STOP and RESTORE will disable the new keywords. They can be simply re-enabled by typing SYS 49800 again (which will not damage any of the programs in memory).

The Hex Dump

We've listed the program with 8 bytes to a line. Every new line has the Hex address of the first byte printed alongside it so that you can keep track of where you've got to. ▶

THE HEX DUMP

C000	4F	4C	44	00	4D	4F	56	45
C008	42	41	53	00	48	52	47	00
C010	4C	52	47	00	47	43	4C	45
C018	41	52	00	53	4D	4F	56	45
C020	00	53	54	59	4C	45	00	47
C028	43	4F	4C	00	50	4C	4F	54
C030	00	4C	49	4E	45	00	00	00
C038	00	00	00	00	00	00	00	00
C040	00	00	00	00	00	00	00	00
C048	00	00	00	00	00	00	00	00
C050	00	00	00	00	00	00	00	00
C058	00	00	00	00	00	00	00	00
C060	00	00	00	00	00	00	00	00
C068	00	00	00	00	00	00	00	00
C070	00	00	00	00	00	00	00	00
C078	00	00	00-	00	00	00	00	00
C080	00	00	00	00	00	00	00	00
C088	00	00	00	00	00	00	00	00
C090	00	00	00	00	00	00	00	00
C098	00	00	00	00	00	00	00	00
C0A0	00	00	00	00	00	00	00	00
C0A8	00	00	00	00	00	00	00	00
C0B0	00	00	00	00	00	00	00	00
C0B8	00	00	00	00	00	00	00	00
C0C0	00	00	00	00	00	00	00	00
C0C8	00	00	00	00	00	00	00	00
C0D0	00	00	00	00	00	00	00	00
C0D8	00	00	00	00	00	00	00	00
C0E0	00	00	00	00	00	00	00	00
C0E8	00	00	00	00	00	00	00	00
C0F0	00	00	00	00	00	00	00	00
C0F8	00	00	00	00	00	00	00	00
C100	45	C3	99	C3	D6	C3	E7	C3
C108	F8	C3	69	C4	24	C5	45	C5
C110	5B	C5	6B	C6	40	C3	40	C3
C118	40	C3	40	C3	40	C3	40	C3
C120	40	C3	40	C3	40	C3	40	C3
C128	40	C3	40	C3	40	C3	40	C3
C130	40	C3	40	C3	40	C3	40	C3
C138	40	C3	40	C3	40	C3	40	C3
C140	40	C3	40	C3	40	C3	40	C3
C148	40	C3	40	C3	40	C3	40	C3
C150	40	C3	40	C3	40	C3	40	C3
C158	40	C3	40	C3	40	C3	40	C3
C160	40	C3	40	C3	40	C3	40	C3
C168	40	C3	40	C3	40	C3	40	C3
C170	40	C3	40	C3	40	C3	40	C3
C178	40	C3	40	C3	40	C3	40	C3
C180	40	C3	40	C3	40	C3	40	C3
C188	40	C3	40	C3	40	C3	40	C3
C190	40	C3	40	C3	40	C3	40	C3
C198	40	C3	40	C3	40	C3	40	C3
C1A0	40	C3	40	C3	40	C3	40	C3
C1A8	40	C3	40	C3	40	C3	40	C3
C1B0	40	C3	40	C3	40	C3	40	C3
C1B8	40	C3	40	C3	40	C3	40	C3
C1C0	40	C3	40	C3	40	C3	40	C3
C1C8	40	C3	40	C3	40	C3	40	C3
C1D0	40	C3	40	C3	40	C3	40	C3

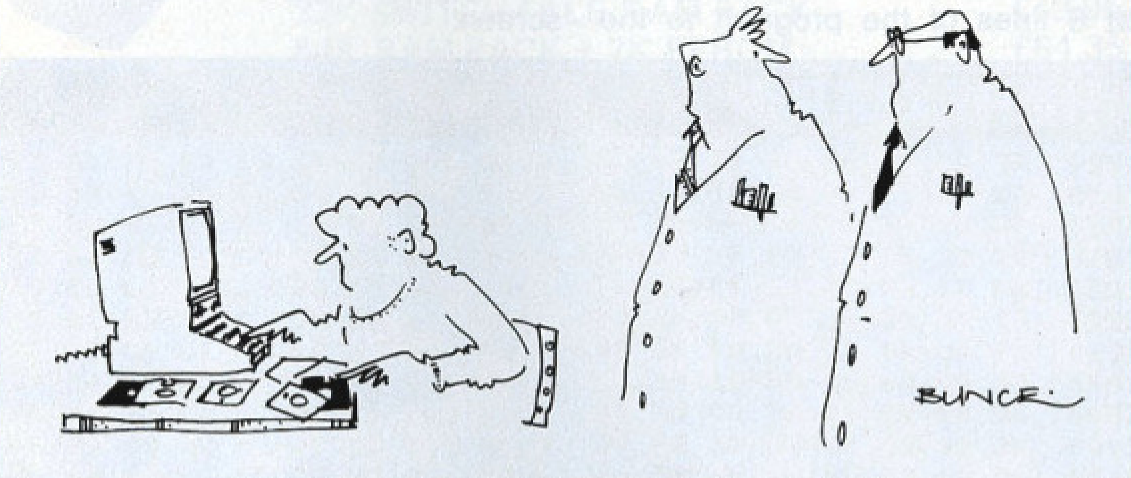
C1D8	40	C3	40	C3	40	C3	40	C3
C1E0	40	C3	40	C3	40	C3	40	C3
C1E8	40	C3	40	C3	40	C3	40	C3
C1F0	40	C3	40	C3	40	C3	40	C3
C1F8	40	C3	40	C3	40	C3	40	C3
C200	93	0D	20	20	20	20	20	2A
C208	2A	2A	20	43	42	4D	36	34
C210	20	2D	20	45	58	54	45	4E
C218	44	45	44	20	42	41	53	49
C220	43	20	2A	2A	2A	0D	0D	0A
C228	20	20	28	43	29	20	41	4C
C230	20	43	52	4F	53	53	20	31
C238	39	38	33	20	20	2A	20	20
C240	36	34	4B	20	52	41	4D	20
C248	53	59	53	54	45	4D	0D	0D
C250	0A	52	45	41	44	59	2E	0D
C258	0A	00	00	FF	FF	FF	9D	DF
C260	00	62	00	20	00	00	00	00
C268	00	40	00	42	00	42	62	02
C270	00	80	00	02	00	00	42	00
C278	60	00	00	00	66	00	FF	00
C280	FD	7D	FF	F7	FF	FF	FF	FF
C288	A9	00	A0	C2	20	1E	AB	A9
C290	4C	85	7C	A9	9E	85	7D	A9
C298	C2	85	7E	6C	02	03	C9	40
C2A0	D0	44	A5	9D	F0	28	AD	00
C2A8	02	C9	40	D0	1C	20	F8	C2
C2B0	A0	00	B1	7A	C9	20	F0	09
C2B8	E6	7A	D0	F6	E6	7B	38	B0
C2C0	F1	20	74	A4	A9	00	38	B0
C2C8	1D	A9	40	38	B0	18	20	F8
C2D0	C2	A0	00	B1	7A	C9	00	F0
C2D8	0D	C9	3A	F0	09	E6	7A	D0
C2E0	F2	E6	7B	38	B0	ED	C9	3A
C2E8	B0	0A	C9	20	F0	07	38	E9
C2F0	30	38	E9	D0	60	4C	73	00
C2F8	A9	00	85	7F	A9	C0	85	80
C300	E6	7A	D0	02	E6	7B	A0	00
C308	A2	00	B1	7F	F0	24	D1	7A
C310	D0	04	C8	38	B0	F4	B1	7F
C318	F0	04	C8	38	B0	F8	C8	98
C320	18	65	7F	85	7F	A9	00	65
C328	80	85	80	A0	00	E8	E8	38
C330	B0	D8	BD	00	C1	85	80	E8
C338	BD	00	C1	85	81	6C	80	00
C340	A2	0B	6C	00	03	A5	2B	85
C348	86	A5	2C	85	87	A0	04	A9
C350	00	D1	86	F0	04	C8	38	B0
C358	F8	C8	98	A0	00	18	65	86
C360	91	86	C8	A9	00	65	87	91
C368	86	A0	00	B1	86	D0	1B	C8
C370	B1	86	D0	16	A9	02	18	65
C378	86	85	2D	85	2F	85	31	A9
C380	00	65	87	85	2E	85	30	85
C388	32	60	A0	00	B1	86	AA	C8
C390	B1	86	85	87	86	86	38	B0
C398	D0	A9	CF	A0	C3	20	1E	AB
C3A0	20	CF	FF	C9	59	D0	27	A9
C3A8	00	8D	00	40	8D	01	40	8D

C3B0	02	40	8D	81	02	A9	40	85
C3B8	2C	85	2E	85	30	85	32	8D
C3C0	82	02	A9	03	85	2D	85	2F
C3C8	85	31	A9	01	85	2B	60	0D
C3D0	53	55	52	45	3F	00	A9	08
C3D8	0D	18	D0	8D	18	D0	A9	20
C3E0	0D	11	D0	8D	11	D0	60	A9
C3E8	F7	2D	18	D0	8D	18	D0	A9
C3F0	DF	2D	11	D0	8D	11	D0	60
C3F8	A9	00	85	86	A9	20	85	87
C400	A9	40	85	88	A9	3F	85	89
C408	A9	00	85	8A	A5	87	C5	89
C410	D0	07	A5	86	C5	88	D0	01
C418	60	A0	00	A5	8A	91	86	E6
C420	86	D0	E9	E6	87	38	B0	E4
C428	A5	2D	85	86	A5	2E	85	87
C430	A0	00	A5	87	C5	30	D0	08
C438	A5	86	C5	2F	D0	02	38	60
C440	B1	86	C5	88	D0	11	C8	B1
C448	86	C5	89	D0	0B	C8	B1	86
C450	AA	C8	B1	86	A8	18	60	C8
C458	98	18	69	06	65	86	85	86
C460	A5	87	69	00	85	87	38	B0
C468	C7	A9	D3	85	88	A9	CE	85
C470	89	20	28	C4	B0	57	98	30
C478	57	C9	08	B0	53	0A	85	FB
C480	A9	01	C8	88	F0	04	0A	38
C488	B0	F9	85	8A	A9	D9	85	88
C490	A9	80	85	89	20	28	C4	B0
C498	34	A6	FB	98	9D	01	D0	A9
C4A0	D8	85	88	A9	80	85	89	20
C4A8	28	C4	B0	21	8A	48	A6	FB
C4B0	98	9D	00	D0	68	C9	00	D0
C4B8	0B	A5	8A	49	FF	2D	10	D0
C4C0	8D	10	D0	60	A5	8A	0D	10
C4C8	D0	8D	10	D0	60	4C	D3	C4
C4D0	4C	DB	C4	20	E3	C4	A2	0B
C4D8	6C	00	03	20	E3	C4	A2	0E
C4E0	6C	00	03	A9	1B	8D	11	D0
C4E8	A9	15	8D	18	D0	60	A9	C2
C4F0	85	88	A9	C3	85	89	20	28
C4F8	C4	B0	22	8A	D0	22	98	29
C500	0F	85	8A	A9	C6	85	88	A9
C508	C3	85	89	20	28	C4	B0	0D
C510	8A	D0	0D	98	0A	0A	0A	0A
C518	05	8A	85	8A	60	4C	D3	C4
C520	4C	DB	C4	00	A9	D3	85	88
C528	A9	80	85	89	20	28	C4	B0
C530	0E	8A	D0	0E	98	F0	04	C9
C538	01	D0	07	8C	23	C5	60	4C
C540	D3	C4	4C	DB	C4	20	EE	C4
C548	A9	00	85	86	A9	04	85	87
C550	A9	E8	85	88	A9	07	85	89
C558	4C	0C	C4	20	AA	C5	20	8C
C560	C5	A5	FB	8D	87	C7	A5	FC
C568	8D	88	C7	A5	FD	8D	89	C7
C570	20	8C	C5	20	D0	C5	A0	00
C578	48	AD	23	C5	C9	01	F0	06
C580	68	11	FB	38	B0	03	68	51

FIRING-UP BASIC

```
C588  FB 91 FB 60 A5 FC C9 01
C590  F0 04 B0 13 90 06 A5 FB
C598  C9 40 B0 0B A5 FE D0 07
C5A0  A5 FD C9 C8 B0 01 60 68
C5A8  68 60 A9 D8 85 88 A9 80
C5B0  85 89 20 28 C4 B0 16 86
C5B8  FC 84 FB A9 D9 85 88 A9
C5C0  80 85 89 20 28 C4 B0 05
C5C8  84 FD 86 FE 60 4C D3 C4
C5D0  A5 FB 48 29 07 8D 18 C6
C5D8  68 29 F8 85 FB A5 FD 48
C5E0  29 07 8D 19 C6 68 29 F8
C5E8  48 4A 4A 4A 85 FD 4A 4A
C5F0  18 65 FD 85 FD 68 0A 0A
C5F8  0A 0D 19 C6 18 65 FB 85
C600  FB A5 FD 65 FC 18 69 20
C608  85 FC A9 80 AE 18 C6 E8
C610  CA F0 04 4A 38 B0 F9 60
C618  00 00 AD 91 C7 38 ED 93
C620  C7 8D 91 C7 AD 92 C7 ED
C628  94 C7 8D 92 C7 08 F0 0C
C630  10 05 A9 FF 38 B0 0E A9
C638  01 38 B0 09 AD 91 C7 C9
C640  00 D0 F4 A9 00 AA 28 10
C648  1B AD 92 C7 49 FF 8D 92
C650  C7 AD 91 C7 49 FF 18 69
C658  01 8D 91 C7 A9 00 6D 92
C660  C7 8D 92 C7 AC 92 C7 AD
C668  91 C7 60 20 AA C5 A5 FB
C670  8D 84 C7 8D 91 C7 A5 FC
C678  8D 85 C7 8D 92 C7 A5 FD
C680  8D 86 C7 AD 87 C7 8D 93
C688  C7 AD 88 C7 8D 94 C7 20
C690  1A C6 8E 8F C7 8C 8C C7
C698  8D 8B C7 A5 FD 8D 91 C7
C6A0  A9 00 8D 92 C7 AD 89 C7
C6A8  8D 93 C7 A9 00 8D 94 C7
C6B0  20 1A C6 8E 90 C7 8C 8E
C6B8  C7 8D 8D C7 AD 87 C7 85
C6C0  FB AD 88 C7 85 FC AD 89
C6C8  C7 85 FD 20 70 C5 AD 8D
C6D0  C7 8D 95 C7 AD 8E C7 8D
C6D8  96 C7 AD 96 C7 30 45 D0
C6E0  05 AD 95 C7 F0 3E 38 AD
C6E8  95 C7 ED 8B C7 8D 95 C7
C6F0  AD 96 C7 ED 8C C7 8D 96
C6F8  C7 AD 90 C7 F0 1A 30 0B
C700  EE 89 C7 D0 13 EE 8A C7
C708  38 B0 0D CE 89 C7 AD 89
C710  C7 C9 FF D0 03 CE 8A C7
C718  AD 96 C7 30 07 D0 37 AD
C720  95 C7 D0 32 18 AD 95 C7
C728  6D 8D C7 8D 95 C7 AD 96
C730  C7 6D 8E C7 8D 96 C7 AD
C738  8F C7 F0 1A 30 0B EE 87
C740  C7 D0 13 EE 88 C7 38 B0
C748  0D CE 87 C7 AD 87 C7 C9
C750  FF D0 03 CE 88 C7 AD 87
C758  C7 85 FB AD 88 C7 85 FC
C760  AD 89 C7 85 FD 20 70 C5
C768  AD 87 C7 CD 84 C7 D0 11
C770  AD 88 C7 CD 85 C7 D0 09
C778  AD 89 C7 CD 86 C7 D0 01
C780  60 4C DA C6 00 00 00 00
```

The above article is reprinted from SECRETS OF THE COMMODORE 64 by P. Cornes & A. Cross, published by Bernard Babani (Publishing) Ltd, ISBN 0-85934-110-0. At £1.95 the book looks pretty good value for money.



One of those 14 year olds, totally conversant with Basic; Pascal; Forth; Lisp; Fortran; Copol; Modula and C. Or we ASSUME so, he doesn't actually SPEAK a language . . .



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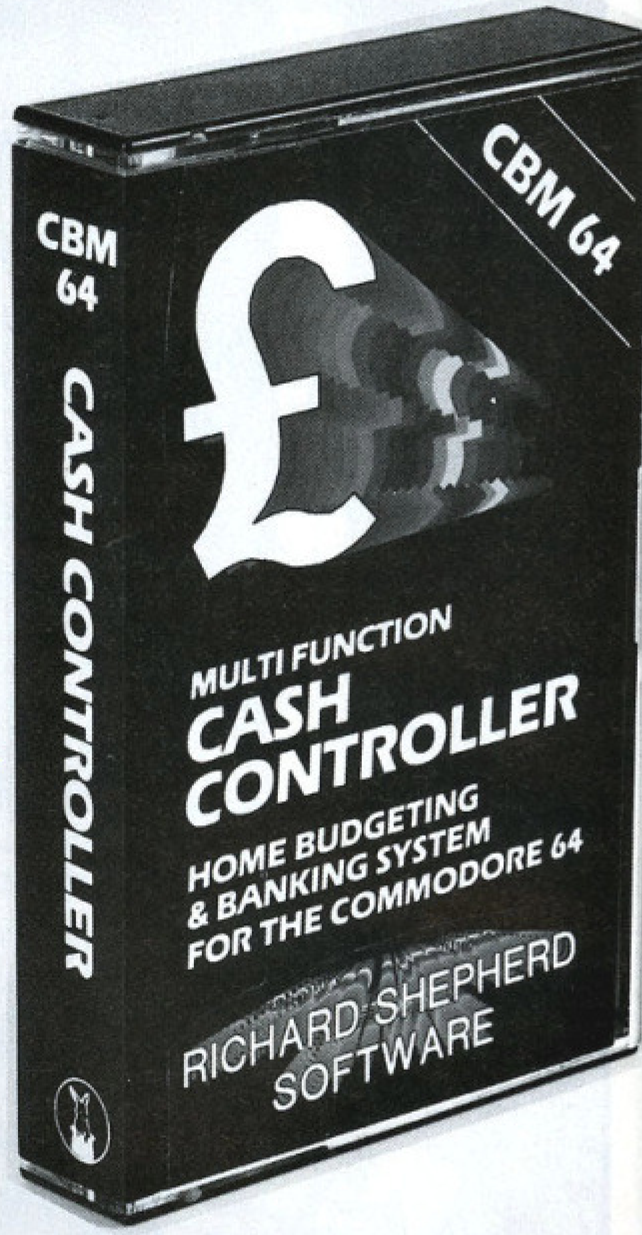
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STARTERS ORDERS

Now that there are plenty of books devoted to the 64, how can you decide which one to choose? Nik Lumsden leads the way.

Back in the dark days of early '83, when the 64's older brother VIC was king of many a suburban castle, you could count the number of tomes devoted to the 64 on one finger — and that included the *Commodore 64 User's Guide*. The *Programmer's Reference Guide* was a legendary grail sought after in vain by many a crusading programmer. We'd all read about the fantastic sprite and music capabilities of our new machine, but how to dig them out — that was the problem. Then, round about April, the first copies of the *PRG* trickled through and silence descended again. As the mists cleared, the 64 started to reveal some of its secrets.

Well, that situation has all changed now. These days barely a week goes by without a new Book of CBM Revelation popping up. So it's back to square one, although this time the problem for newcomers is what to choose from this veritable cornucopia. Many of the books mentioned in this review naturally duplicate areas already covered by the two official Commodore guides — some, in fact, do so with a great deal more lucidity, especially for a beginner. So let me stress the prime importance of acquiring the *Programmer's Reference Guide* as your major source book, after which a judicious selection from the following titles should set you well on the road to enlightenment.

In this first issue we can't hope to do more than give a brief resume of some of the material that has appeared over the last 12 months. Most of the books are general in nature and clearly aimed at the beginner — they contain a fair sprinkling of barren leaves such as ASCII codes, error messages tables and set-up routines, all succinctly if somewhat dryly covered by Big C itself. Over and above this duplication, however, they all contain useful general routines which should help to clarify some of the more shadowy aspects of Basic — such as string handling, multi-dimensional arrays and that seemingly impregnable sound barrier, the SID chip.

So, for starters, we have Ian Sinclair's *Commodore 64 Computing*. This is clearly aimed at the beginner, but does a fairly thorough job on sprite definition, menu construction and one-voice routines for the music chip. It's already beginning to show its age and is a survivor from the days when the *PRG* hadn't hit these shores; it should, however, whet the beginner's appetite sufficiently to let programming begin.

Software 64 by Owen Bishop gets its teeth into programming proper and contains 13 practical listings. The first, 'Accountant', runs to six densely-packed pages and looks guaranteed to keep fingers tapping far into the night. I can vouch for 'Sounds Incredible', which gets all three voices of your 64 singing and it's useful too for experimenting with some of the more esoteric parameters of the SID chip. Other utilities include an Info File, a Phone Call Coster and a Pools Forecaster. All programs are tape-based but can easily be converted to work with disk.

Mr Bishop's companion volume, *The Commodore 64 Games Book* bears the subtitle '21 Sensational Games'. The monochrome screen shots which head each section seem bent on belying this claim and aren't likely to send anyone rushing to the keyboard. But don't let this deter you: there's plenty there to give budding games programmers a taste of what can still be done in Basic. Incidentally, 'Snorkel', with its pearl-fishing theme and clever use of six independent underwater sprites, looks like an early prototype for current rave *Scuba Dive*. All the games are keyboard-controlled, but can be adapted to work with a joystick.

Sunshine Books got off to a cracking start with David Lawrence's *The Working Commodore 64*. This adopts a modular approach to programming which lets you type in and test each segment as you go. You can then give your bruised digits a rest and take in the crystal clear annotations before proceeding. I like this approach. Apart from learning as you go, it isn't nearly as daunting as tearing through half a metre of almost intractable code which promptly crashes before you've got round to SAVEing it.

Chapter 1 gets you going with 'Clock' — which is just that, but also features an artful use of four-colour screen sector-



MARC ARUNDALE

ing that changes every couple of minutes. This really is a show-stopper that requires very little keyboard dexterity. There are short routines for DELETE, MERGE and RENUMBER (including GOTOs and GOSUBs), and substantial listings for painting with block graphics, filing, data manipulation, and a 'Mastermind'-type base into which you can enter your own quizzes. The generous sections on finance, music and 'The 64 as Secretary' all deserve some scrutiny. This is one that'll really get your computer working for you.

Despite the opening gambit, I can't claim any great affinity with adventure games. It therefore came as a pleasant surprise to come across *Commodore 64 Adventures* by Mike Grace. The book itself is something of an adventure, its author even admitting that before he started on the book he was a fairly inexperienced programmer. In Part 1 he takes you through some of his own pitfalls and perils, at the same time giving you a basic framework on which to hang your own adventures. Part 2 (some 120 pages!) takes you step by step through all the modules which make up 'Nightmare Planet' — a complete adventure by the author, which all but overflows the 64's available memory capacity! Lots of nice touches here: sprites, sound effects and — that vital ingredient — a sense of humour. Three appendices contain variables and flow charts just to help you find your way around the listings. If you haven't kissed a princess lately, GOTO line 14000, this should convert you!

Ian Stewart and Robin James have written extensively for Shiva's 'Friendly Micro' series. Their *Easy Programming for the Commodore 64* is, in their own words, "intended to bridge the gap between the *Manual* and the *Reference Guide*". It does just that, with admirable layout, lots of diagrams and some truly appalling puns. Some of the listings may lack elegance but they *do work* and are easily understood. Interpellated into the text are six very useful sections on debugging which could save you hours of nail-chewing. The short intro to hi-res graphics will get you drawing circles and polygons at the drop of a pixel. Nice one!

At this point the books started getting weightier and invariably more pricey. It's interesting, incidentally, to note the arrival of many of the well-established doyens of publishing into the micro arena: Duckworth, Prentice-Hall, Hodder & Stoughton — even Macmillan's elder statesman (remember Super Mac?) has been snapped within groping distance of a Speccy. Biographies and cookbooks are evidently not making the charts these days.

Duckworth, with a long list of intriguing titles in the pipeline, hit the racks early on with Pete Gerrard's *Using the 64*. Here, though, after only 60-odd pages of the usual prelims, we're straight into machine code; an Assembler is included to help you on your way. There's also a very useful routine for programming the function keys — a subject which seldom gets much coverage. The section on graphics is skimpy, but this is well compensated for by the excellent documentation on sound. You can boogie with Jim Butterfield, play variations on the *Close Encounters* theme and use your keyboard to play in harmony. All this and we're only half way through! Further along there's info on peripherals, memory maps, chip configurations ... it's all in there somewhere. I have only one gripe: this is a fat book of almost Harold Robbins proportions; open it flat at the side of your 64 and the pages drop away from the glue like autumn leaves. Publishers please take note: if you can't run to a stitched binding, at least bench-test your glue. Nevertheless, this is definitely one for your short list.

Commodore 64: Getting the Most from It by Tim Onosko is of American origin. This one's very well-stitched, and well-heeled to boot. The larger format and high quality print make it a pleasure to pick up and use.

All the usual ingredients are here: basics first, colour, graphics and sound, not forgetting joystick routines. I particularly liked the chapter on word processing which contains an evaluation of four of the most popular packages. This even tempted me into sampling *EasyScript*, which I'm making good use of for this article. The 100-plus pages of appendices are even meatier. There's breezy Jim Butterfield 'Exploring' as usual; Paul Schatz on 'Graphics' (including a Gothic character set generator); and Dr Frank H Covitz on 'The Well-Tempered Computer' (or sounds, to you). Check it out ... it's worth its weight in *Chinese Jugglers*.

Another American import is *Your Commodore 64* by John Heilborn and Ran (US-ese for Ron?) Talbot. This again uses a large format and covers more or less the same ground as Onosko above. It's very good on explaining some of the harder-to-grasp concepts of symbolic logic and Boolean operators (by using a simple supermarket analogy), and particularly clear on the use of the disk drive and printer. By and large, however, Onosko & Co win hands down.

Meanwhile back on the home front, *Winning Games on the Commodore 64* (Ellis Horwood, £5.95) recently caught my eye. Its authors, TP Barrett and SW Colwill, have perhaps been over-modest in their choice of title. There's far more here than a score of clearly printed games listings and how to win 'em. The first 100 or so pages are jam-packed with programming hints: 'Interesting POKEs'; multi-colour and hi-res sprite demos; joystick routines, including one in machine code for greater speed; sound effects; and one I can't wait to try — a space age character set! Only after that do we get down to the serious business of the games themselves. Apart from the standard caravanserai of 'Zappy Zookers' and 'Cosmic Caperers' there's a useful 'Drum Kit' for bass, snare, high and low tom-toms and the intriguingly titled *Attack of the Tomato*: "Let more than five past and your city becomes ketchup!". This one gets my 'Value for Money Award' for the month.

And that little lot is by no means all. Mark Greenshields' *Mastering the Commodore 64* devotes a great deal of its space to machine code and we'll be bringing you some of his programs in *Your 64*. There's also David Lawrence & Mark England's *Machine Code Master* (Sunshine, £6.95) which gives a full Assembler listing and many routines for extending Basic. Another typing marathon, this one.

So, with apologies to the dozen or so authors we've had to miss out, yer pays yer money and yer takes yer choice. Spend some time in a large book-store leafing through as many of these titles as you can before shelling out the greenies. If you can afford 'em all, we'd like to meet you.

It's now quite clear that the last 12 months have seen the 64 really establish itself, not only as a fine machine within most people's reach, but also one that's been written and written about. And there's going to be plenty more where that came from. Watch this space. 64

THE STORY SO FAR

Commodore 64 User's Guide,
supplied free with your 64.

The Programmer's Reference Guide,
Commodore Business Machines & Howard Sams & Co Inc.
ISBN 3-88963-183-5, £14.95.

Commodore 64 Computing,
by Ian Sinclair, Granada,
ISBN 0-246-12253-7, £5.95.

Software 64,
by Owen Bishop, Granada,
ISBN 0-246-12266-8, £5.95.

The Commodore 64 Games Book,
by Owen Bishop, Granada,
ISBN 0-246-12253-7.

The Working Commodore 64,
by David Lawrence, Sunshine,
ISBN 0-946408-02-5, £5.95.

Commodore 64 Adventures,
by Mike Grace, Sunshine,
ISBN 0-946408-11-4, £5.95

Easy Programming for the Commodore 64,
by Ian Stewart & Robin James, Shiva,
ISBN 0-906812-64-X, £6.95.

Using the 64,
by Peter Gerrard, Duckworth,
ISBN 0-7156-1777-X, £9.95.

Commodore 64: Getting the Most From It,
by Tim Onosko, Prentice-Hall,
ISBN 0-89303-380-4, £7.95.

Your Commodore 64,
by John Heilborn and Ran Talbot, Osborne/McGraw-Hill,
ISBN 0-88134-114-2, £10.00.

Winning Games on the Commodore 64,
by TP Barrett & SW Colwill, Ellis Horwood,
ISBN 0-85312-695-X, £5.95.

Mastering the Commodore 64,
by Mark Greensheilds, Interface,
ISBN 0-907563-38-4, £7.95.

Commodore 64 Machine Code Master,
by David Lawrence & Mark England, Sunshine,
ISBN 0-946408-05-X, £6.95.

SX-64

The computer industry's attention seems momentarily captured by Sir Clive's Quantum Leap into the small business market. And the question on everyone's lips is whether machines like the SX-64 are going to stand the competition. Join Henry Budgett *at his bench and find out if Commodore have missed the business boat. . ..*

As a home computer the original Commodore 64 was a remarkably well thought out piece of equipment. Designed to compete with the likes of the Atari 800 (and the Apple II if we are to believe Commodore's marketing) the machine offered sound, colour graphics, sprites and much more. All the results of your programs or the various games displays could be produced on a standard colour television or an optional high-quality colour monitor.

In order to bring out the best of the machine's hardware features, provision was made for programs to be loaded either from cassette or cartridge and, should the user actually be interested in developing software or learning to program, the range of Commodore disks and printers could be added. All seemed hunky dory, the machine sold well and, with the vast library of software available from the earlier days of the Commodore PET and its 3000 and 4000 cousins, it was only natural that the small business angle should be exploited. Sadly, this is where the nicely balanced equation starts to fall apart.

The first inkling that Commodore was preparing to attack the desktop market with a Commodore 64-based machine came at the 1982 Winter Consumer Electronics show where the company displayed a trio of 64-based portables. At this time the only other portables to wield any real impact in the market were the Osborne and its imitators; that made the concept rather interesting. The first European showing of the machine took place at the annual Hanover Messe in April of last year. The neat and attractive styling met with general approval from both the dealers and the computer press and the final version, the SX-64 was finally thrust on to the market at the beginning of the year.

But — and it's a big but — since the original showing of the machine the market for portables has changed slightly; the question is, can the SX-64 still compete with systems like the Compaq, Hyperion and Apricot, to mention but a few? Clearly Commodore believes it can and, with a price tag of less than £900, its only immediate competition would appear to be the Wren. However, if anything is going to upset the marketing of the Commodore SX-64 it isn't the price or the styling but more the actual capabilities of the hardware. For, whisper it not, under that fancy silver-grey wrapping all is not as it should be . . .

The Superstructure

Commodore is taking care to point out that the SX-64 is 'based on' the existing model; in fact, the actual hardware has been substantially re-designed to make it fit the new role. The casing measures 14.5 by 14.5 by 5 inches and it's made of a pleasant silver-grey plastic with black grilles and a black fascia. The lid of the case detaches to reveal the integral screen and disk drive, while the lid itself contains the keyboard.

The carrying handle deserves particular mention. Specially designed to make carrying the SX-64's 24.6lbs a very unpleasant experience, it's been covered in a hard, non-slip plastic. If you carry the thing for more than a few yards the handle pattern gets indelibly stamped into the palm of your hand! The same handle is also fitted with locks allowing it to act as a rigid stand for the SX-64 when the device is being used desktop style.

To the rear of the case is a heavily heatsinked area that houses the various components of I/O socketry. The power cable, mains switch and fuse are mounted on the right and the supplied cable came fitted with a right-angle plug which made it possible to use the SX-64 in a somewhat unconventional upright position. I suspect though that any other leads or interface units connected to the back panel would prevent this.

In the middle of the panel is the user port (actually a PCB edge connector), that supports any parallel devices and can be adapted to drive the bigger Commodore peripherals that use the IEEE 488 interface system. Over to the left are two 9-pin joystick connectors and two DIN-type sockets that support the serial interface for disks and printers and the full-sized colour monitor.



IAN McKINNELL

The SX-64 uses the carrying handle to act as a rigid stand when the machine is being used desktop-style.

SX-64

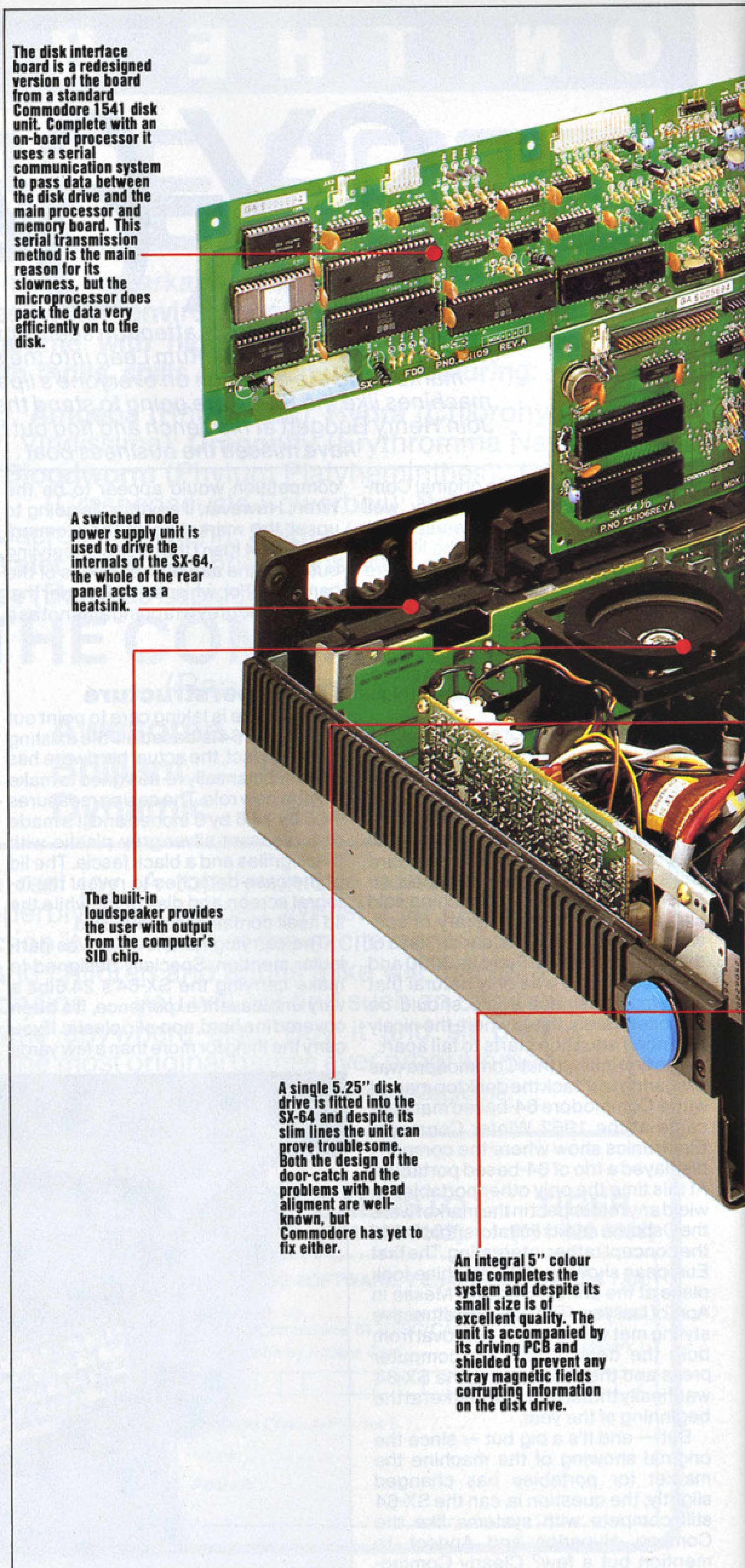
Comparison with a standard Commodore 64 immediately reveals the absence of the cassette connector and the cartridge point. The latter is now located in the top of the case while the cassette port is not implemented at all on the SX-64. Also conspicuous by its absence is any means of connecting the SX-64 to a standard television set which means that you've got to buy the Commodore monitor to get a decent-sized display at home or the office. Doubtless someone will rapidly offer an adaptor, it should be quite simple to produce.

The keyboard is detached from the main unit and the cable which links the two together, plugs from the rear of the keyboard into the underside of the main unit. Here there's a major design flaw. Forget to remove the cable before swinging the handle from the working to the carrying position and it's quite likely you'll smash the keyboard plug. Even worse—when you do remove the cable there's no way to plug a hole in the main casing that's some 1.5 inches square and large enough for paper clips, rain, etc, to fall through into the disk drive mechanism. Not only that, both the power and keyboard cables are supposed to be placed in a special pouch which clips on to the handle for transport. I say 'supposed to' because neither of the review SX-64s I've encountered have been supplied with said pouch, which can make things a little awkward. Ever tried running for a train with six feet of mains cable strung round your neck?

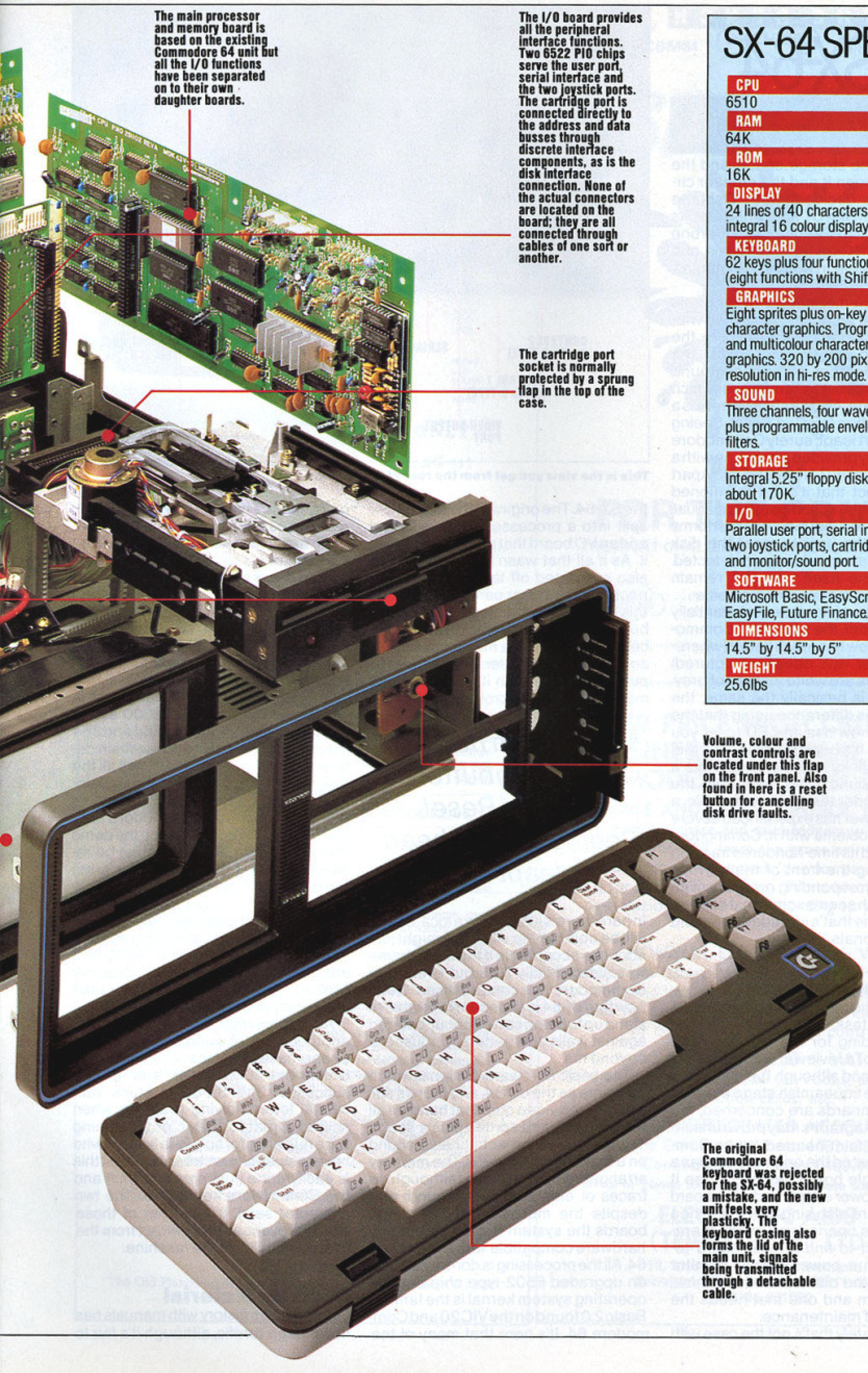
That Drive Again

Once the case has been opened and you've assembled the machine the first thing you'll notice are the 5-inch monitor and the single disk drive. The monitor can support all the colours and graphics modes of the SX-64 and boots up in the familiar dark/light blue combination. Text display is the Commodore standard 25 lines of 40 characters and is quite legible — although a full-sized display is really needed for non-remote operation. Unfortunately the disk drive is the one we've grown to hate from the standard 1541 drive unit; really it should have been replaced by now. Among its most common faults is a habit of not locking shut properly and repeated alignment problems.

Immediately above the drive is a cavity labelled 'storage'. Commodore offers a two-drive version of the SX-64 in the States called the DX-64 — here in Europe we get a hole! Anyone who's foolish enough to use the space to store their disks deserves to lose all their data; there's no shielding between the



Opening up the SX-64 may prove an unsuitable task for the faint-hearted.



The main processor and memory board is based on the existing Commodore 64 unit but all the I/O functions have been separated on to their own daughter boards.

The I/O board provides all the peripheral interface functions. Two 6522 PIO chips serve the user port, serial interface and the two joystick ports. The cartridge port is connected directly to the address and data busses through discrete interface components, as is the disk interface connection. None of the actual connectors are located on the board; they are all connected through cables of one sort or another.

The cartridge port socket is normally protected by a sprung flap in the top of the case.

Volume, colour and contrast controls are located under this flap on the front panel. Also found in here is a reset button for cancelling disk drive faults.

The original Commodore 64 keyboard was rejected for the SX-64, possibly a mistake, and the new unit feels very plasticky. The keyboard casing also forms the lid of the main unit, signals being transmitted through a detachable cable.

SX-64 SPECS

CPU
6510

RAM
64K

ROM
16K

DISPLAY
24 lines of 40 characters on integral 16 colour display

KEYBOARD
62 keys plus four function keys (eight functions with Shift).

GRAPHICS
Eight sprites plus on-key character graphics. Programmable and multicolour character graphics. 320 by 200 pixel resolution in hi-res mode.

SOUND
Three channels, four waveforms, plus programmable envelopes and filters.

STORAGE
Integral 5.25" floppy disk holding about 170K.

I/O
Parallel user port, serial interface, two joystick ports, cartridge port and monitor/sound port.

SOFTWARE
Microsoft Basic, EasyScript, EasyFile, Future Finance.

DIMENSIONS
14.5" by 14.5" by 5"

WEIGHT
25.6lbs

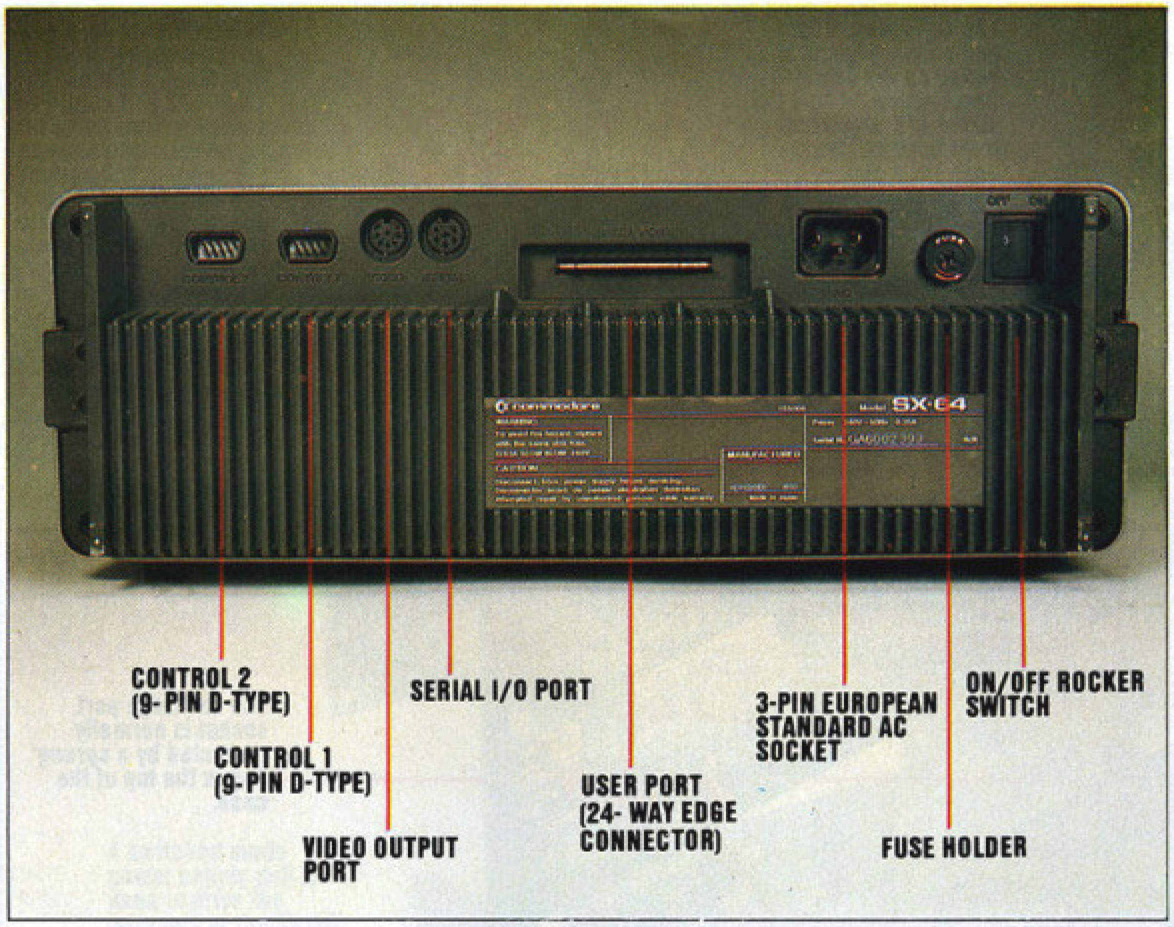
IAN McKINNELL

SX-64

drive and the storage space, and the shield between it and the monitor circuitry looks decidedly thin. Osborne tried this with the 01 and, while it looks nice and logical, the idea is all too prone to disaster. Keep your manuals and keyboard cable in there by all means, but disks — no way!

On the extreme right of the front fascia is a little flap tastefully decorated with the Commodore logo. Inside are the volume and colour controls for the monitor, together with background controls which set the range over which these operate. Also nestling in here is a tiny pushbutton labelled Reset. Seeing this my heart leapt; surely Commodore hadn't finally provided a machine with a real reset facility? No such luck! Apart from the fact that it's not mentioned anywhere in the accompanying manual, it transpires the real function it performs is to allow the user to reset the disk drive when an error has been detected. The machine itself can still remain locked-up till the cows come home...

The keyboard has been substantially changed from the standard Commodore 64. It now lies much flatter (whereas the other was deeply sculptured) and the keys are white instead of grey. The layout is basically the same, the only obvious difference being that the Shift Lock now has an LED to let you know when it's been pressed. The feel is very plasticky and the keys make a clacking sound; and although the machine under test gave no trouble, a fellow reviewer has experienced severe reliability problems with it. Commodore has followed its time-honoured tradition of engraving the front of the keytops with the corresponding graphics symbols — which seems somewhat strange on a machine that's intended to be sold to professionals.



This is the view you get from the rear of the SX-64.

Rummaging Inside

Taking the lid off a Commodore SX-64 is no easy task, and indeed one well worth avoiding for the average user. However, for a reviewer such tasks are mandatory and although I've long since got past the squeamish stage as far as computer innards are concerned, the next few paragraphs may prove unsuitable for the faint-hearted! When Commodore created the original 64 it was a simple, single board design. OK, so it needed a power supply and a keyboard but these are also single PCBs. When the SX-64 is opened you might, therefore, expect to find a main board together with a power supply, monitor board and the disk controller. A nice, neat system and one that needs the minimum of maintenance.

Unfortunately that's not the case with the SX-64. The original 64 board is now split into a processor/memory board and an I/O board that piggy-backs onto it. As if all that wasn't enough they've also separated off the cartridge connector and the rear panel socketry. All this lot is interconnected by ribbon and bundled cables in profusion and that's before you add in the monitor assembly and the disk controller. All in all, and to put no finer point on it, the result is a mess; if a cable gets broken or detached in here there's just no way a local dealer will be able to help. All of this might just about be acceptable if the metal frame was substantially built but even here Commodore has compromised. Quite how the SX-64 is expected to be able to stand up to being carted about, banged against walls and generally abused is beyond me.

> *"Nestling in here is a tiny pushbutton labelled Reset. Seeing this my heart leapt..."*

The basic hardware design is much the same as the old 64, and there's still a dedicated video chip that handles all the graphics and sprites plus a sound chip (who wants three channels of sound on a business machine?). The memory arrangement is the same (although no traces of elephants were found) and despite the mutilation of the circuit boards the system should be entirely hardware compatible with the existing 64. All the processing is done by a 6510, an upgraded 6502-type chip and the operating system kernal is the familiar Basic 2.0 found on the VIC 20 and Commodore 64. It's here that many of the real changes have been made, and all references to cassettes seem to have been expunged from the ROM so even if you wanted to add one there's no built-in driver to control it.

Basic Decisions

It's at the Basic level that one really starts to ask why Commodore didn't take this opportunity to go for Basic 4.0 on the SX-64. After all, the language is well proven through the 8000 series and the newly announced 264 and 364 machines will be using it. The main difference for the user is that it has all the disk facilities built in, something painfully lacking on Basic 2.0. Before anyone points out that Commodore supplies the DOS Wedge utility on the demo disk which rectifies this, it must be remembered that the perceived market for the SX-64 is as a portable computer for professionals. Can you really see the frontiers of computer literacy being driven back by an operating system that requires you to type LOAD"0:$",8 and then LIST just to get a disk directory (which overwrites the program you had in memory just for luck)?

Also somewhat surprising, but just another result of using Basic 2.0, is the upper case/graphics character set. Unlike the 8000 series, and its 700 successor, the SX-64 is stuck with capital letters, giving graphics when shifted. Great for Basic programming but a nuisance for software houses who have to swap character sets. Whilst this is easily done (just pressing Shift and the Commodore key toggles the two character sets), it's another of those little annoyances that detract from the overall usability of the machine.

Back-Up Material

Commodore's history with manuals has never been terrific, although it's fair to

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"I used the programs Wordpower and Besieged as part of my preparation for my English GCE O level exam re-sit, which I successfully passed with a Grade A result.

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S

SX-64

say that it substantially redressed the balance with the VIC 20 and Commodore 64 *Programmer's Reference Guides*. The review machine came with a single manual — although I believe there should have been two. The obvious American origins — it talks of 'color' and I'm sure we use 220/240 volts and not 120 — are minor nuisances. Based on the existing Commodore 64 manual, with a search and replace making it the Executive instead, although it lacks serious programming notes it does provide a reasonable overview for the beginner. If programming of any sort is to be tackled then the previously mentioned *Programmer's Reference Guide* is an absolute must, along with one or two of the independant books (see reviews elsewhere in this issue).

The Software Situation

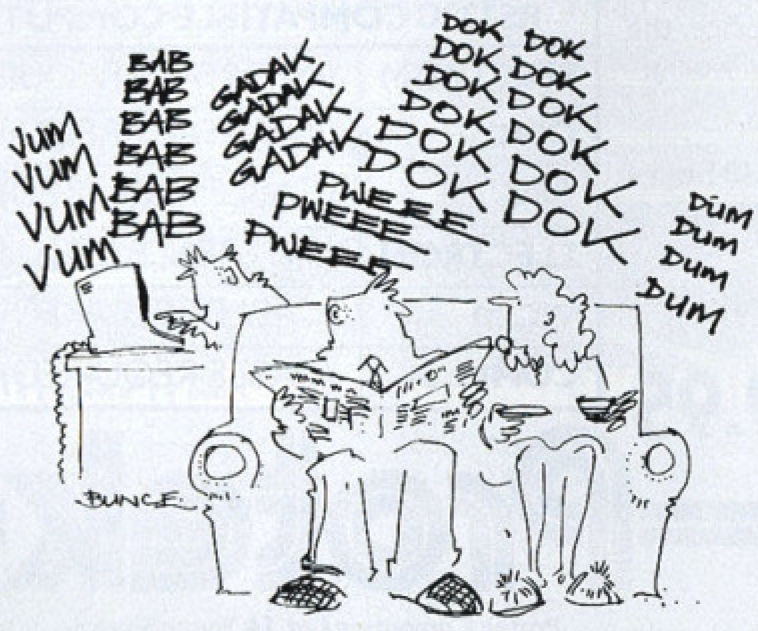
Being a bundled machine, Commodore reckons that you get £210-worth of free software and the user will probably want to come to terms with the three supplied packages. Of these — *Easy Script, Easy File* and *Future Finance* — I only had time to look at the first. Being Commodore's own word processor and already established on the 64 it probably rates as about average in terms of usability. I'm a confirmed believer in the old saying that the only good word processing package is the one you use (*Applewriter IIe* in my case) but I found no real problems with *Easy Script*. The only drawback to its use, and I suspect that this comment applies to the other packages as well, is the apallingly slow speed of Commodore's disks. Loading the program is slow enough (even the command LOAD "EASY SCRIPT",8,1 takes some getting used to) but waiting for a text file of any real length to load is real torture. At least one software house has now cocked a snook at the 64's disk system and uses a 'turbo load' cassette system which loads faster from tape than from the existing disk! Users with a burning desire to achieve this on the SX-64 have, of course, been stymied by Commodore's removal of the cassette port...

Apart from the massive Commodore software library there's also a large supply of independently produced material that you can feed the SX-64.

> *"The question is, can the SX-64 still compete with systems like the Compaq, Hyperion and Apricot...?"*

Of course much of the 64-based material is supplied on cassette so the SX-64 user cannot yet get to it, but perhaps this will stimulate the disk market to grow. Commodore's claims that all existing software will run perfectly on the new machine have met with at least one firm rebuttal. I understand that the well-loved *Petspeed Compiler* steadfastly refuses to operate properly, because when it checks for the required dongle (a hardware protection system that plugs into the joystick port) it cannot find it. Whether this problem is common to all dongle protected programs or not remains to be seen but *Petspeed's* authors are currently working on the problem.

In terms of hardware support Commodore users do better than most. As well as being able to add up to five extra disk drives externally, there's a range of printers, a pen plotter, the VIC modem and a choice of two full-size monitors. For the avid games player several types of joystick, paddle and trackball are available and, for those who want the ultimate in one-upmanship, a speech synthesis module! Apart from the various Commodore peripherals a number of independent offerings also exist.



I think I preferred it when he was addicted to glue!

Budgett's Verdict

Summing up the SX-64 it's probably fair to say that, in the under £1,000 bracket, there's not a lot to touch it. However, to call it an Executive computer and target it for serious business use is a different cup of meat. If your company uses any system other than Commodore for its main computing, then there's little point in buying an SX-64 because any data stored on its disks will be very difficult to retrieve — and, surely, that's what portable computers are all about? For the person who needs a truly portable computer system, the weight of the SX-64 puts it into the class of the 'luggable' rather than the truly portable. Something like the Epson HX-20 or Tandy's Model 100 would, perhaps, be rather more suitable.

What the SX-64 does have going for it, though, is the vast amount of support generated by the PET, 3000, 4000 and Commodore 64 systems. Almost any software package you might require exists and if it doesn't, then the range of available languages is sufficient to let you develop it for yourself. The promise of a CP/M cartridge for the SX-64 would increase this library substantially to include some of the most popular business software available, given that it can be implemented within a 52K machine (Commodore's intelligent disk system may also prove a stumbling block here). If they really do get a true CP/M system operating then some of the other arguments also vanish because most micro-based business systems do use CP/M as their prime operating system.

When I first reviewed the Commodore 64 I felt strongly that all the nice facilities provided had been distanced from the novice user; it's very difficult to write programs using the sprites and sound (*Simons Basic* notwithstanding) unless you can program in Assembler. In much the same way I feel that the potential for a sub-£1000 portable is large enough to have justified Commodore putting a little more effort into the SX-64 than it has. Osborne got away with a tiny screen by keeping it black and white and scrolling it over a full sized display with some very clever software. Commodore has just left it as it is and 40-column word processing is no fun at all for someone used to a full-screen display.

Just who will buy the machine is uncertain. I'd put my money on the growing market that wants a colour graphics home computer that's neat, doesn't have miles of loose wires, comes with some standard software and doesn't cost both legs to buy. Professionals and businessmen? I think they'll demand something a little more professional and businesslike.



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HOLY JUPITER IT'S JUMPMAN!

Epyx has contrived a watertight connection between rockets, bats, ladders, dragons, snowflakes, girders and copycats. It's called Jumpman, a Donkey Kong-like game for the Commodore 64. **Bob Chappell** ***overviews, while*** **Ian McKinnell** ***offers the benefit of some hard won nutterist advice.***

Jupiter Headquarters has been infiltrated by the Alienators. These little rascals have planted several bombs on all of HQ's thirty levels — they obviously like to do a thorough job. Is there a human brave enough to defuse all these bombs and so reprieve this magnificent landmark? One pace forward steps a strange little figure wearing an outboard motor where a rucksack would normally be. It's none other than the legendary superhero, Jumpman (who else but a superhero would be stupid enough to volunteer?).

You will be the force that drives Jumpman to feats of unparalleled daring. It will be your skilled and nerveless manipulation of the joystick that will enable him to skip along rooftops, to leap gaily over yawning chasms, to shin lightly up and down ropes, ladders and girders, and to break all speed records along narrow walkways.

Like Peter Cooke's Leaping Nuns of Norwich, Jumpman loves to leap, and leap he must. Both high jumping and long leaping will be essential activities if he is to defuse the bombs which have been seeded in all sorts of inaccessible and dangerous places. He will need all of his rocket-assisted prowess to avoid the many deadly hazards that will be encountered. Fortunately, not only has he the agility of a cat but most of the luck of one, too — he has seven lives. If you think that sounds over generous, remember that there are 30 different levels to clear, each with its own collection of bombs and perils. Seven lives seems pretty stingy when you're facing that sort of challenge.

Jumping To Attention

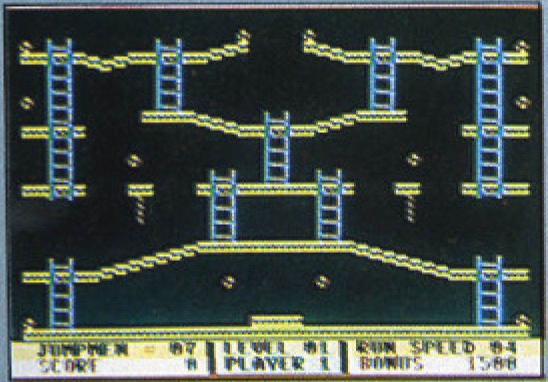
The game is only available on disk and loading and running is simple — just insert the disk and type LOAD "*",8,1. While this is going on you'll be rewarded with your first view of Jumpman. Once loaded, the program colourfully displays the publisher's name to the accompaniment of a merry tune — and then goes into an animated program title display; the sequence continues until the Return key is pressed.

Ever onward to the first point of decision where a menu offers five game options: Beginner, Intermediate, Advanced, Grand Loop and Randomiser. The first three have eight, ten and twelve unique levels respectively. Successfully completing any one of these three groups supplies the heart-warming view of HQ with the lights on in the appropriate building — what better reward for a superhero? Grand Loop will take you through every single level in sequence; I don't know what the reward is for finishing that — probably something stupendously gratifying like a 'Thanks, Jumpman' sign displayed on top of Jupiter HQ. Randomiser always starts with the episode called 'Robots II' but thereafter each of the other 29 episodes will be seized at random — a

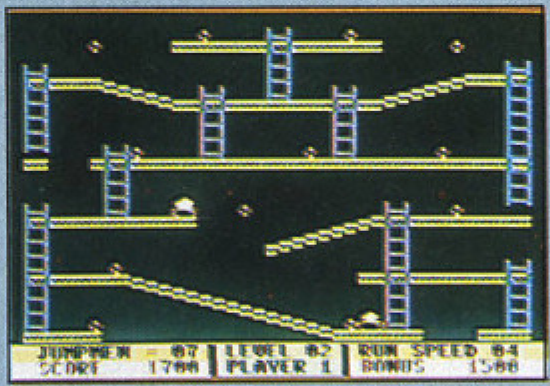
MCKINNEL'S GUIDE TO JUMPMAN ADDICTIONISM

Jumpman is not a game that encourages those with strained face and a desire to 'shoot 'em up'. True, a great deal of skilful joystick manipulation is essential, but so is sweet reason and an awareness of the underlying logic of each level. Many levels have distinct causal relationships within their structure (for instance picking up one bomb may cause a barricade to be built around another); understanding and dealing with these factors will stand you in much greater stead on the high scores table than any proven ability to be able to blast down Mekons at the arcade.

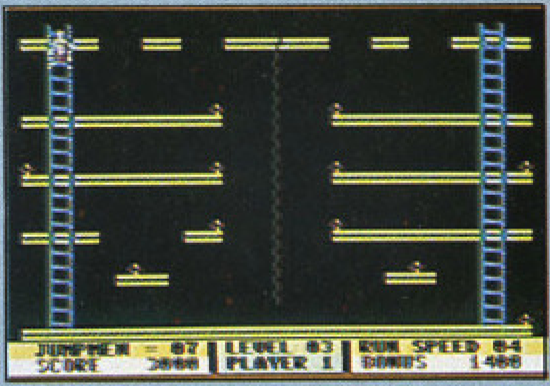
So you want to know how to complete all 30 levels of the Grand Loop and gain our Mega-Trainspotter-of-the-Year Award? Okay, that's simple. Just play it for hours and days and weeks until you die of terminal over-consumption — or on the other hand you might read on and glean something from the ramblings of a seasoned Jump freak



EASY DOES IT If you can't get past this level without any help then perhaps you should seriously investigate the second-hand value of your disk; and if you can't achieve a bonus of at least a thousand points, then you're not even trying.



ROBOTS 1 Just as in 'Robots II', these little chappies are not exactly blessed with a full set of marbles — they always take the same course around the maze, except here they only move to their next location after you pick up a bomb. Take the bomb in the middle of the screen last and be grateful there are no *$$&**! bullets!



BOMBS AWAY What this shot doesn't show are some very nasty red bombs that fall from the top of the screen — and the US Surgeon General has determined that these are most hazardous to Jumpman's health. Don't go to the very top of the screen — take the girder below and jump across using the rope.

HOLY JUPITER IT'S JUMPMAN!

great way to get to lay hands on parts of the game you might never get to see otherwise (assuming you can overcome Robots II,) which itself is no picnic.

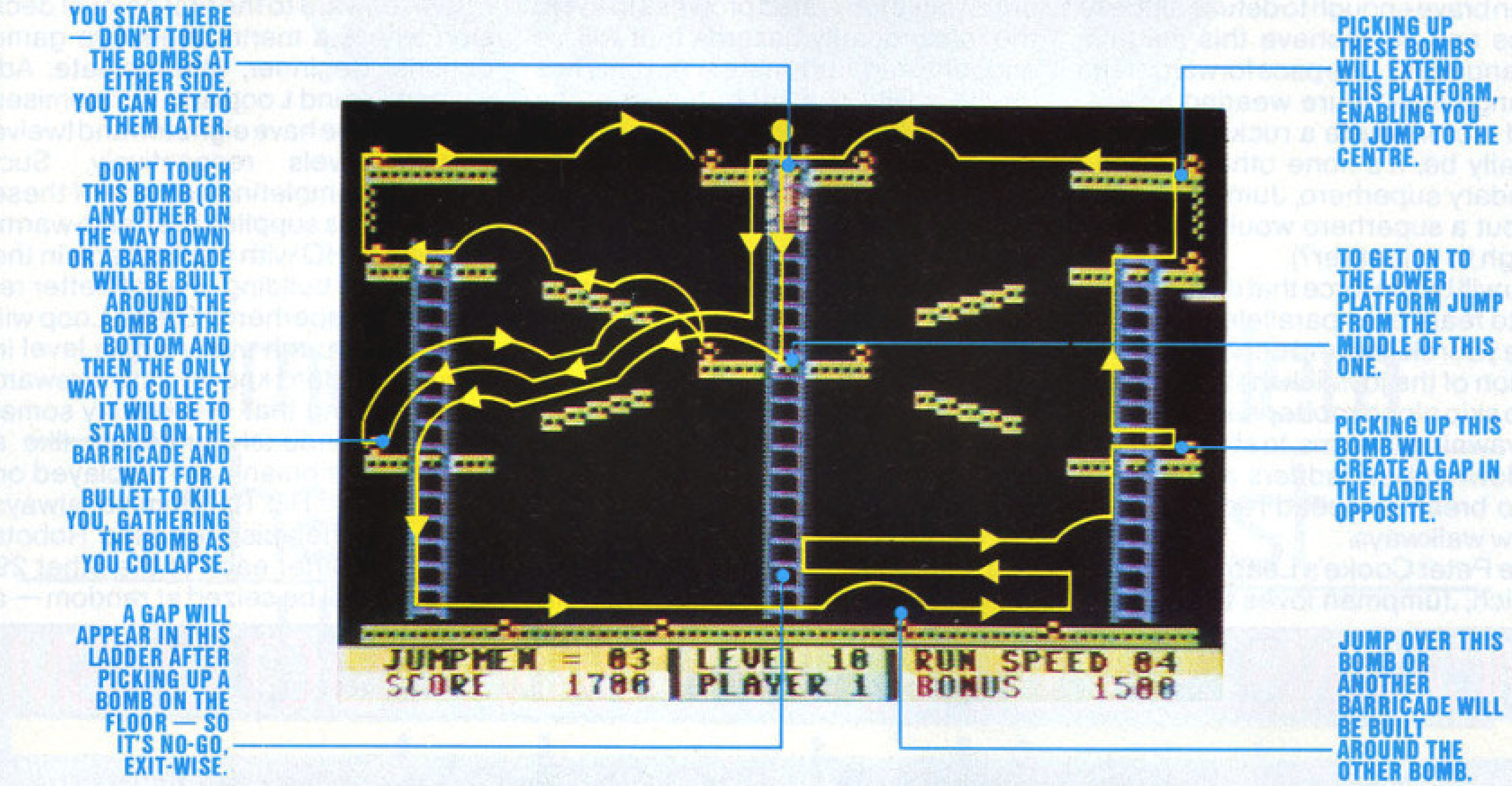
Not content with giving you 30 levels to contend with, our programmer, the sadistically brilliant Randy Glover, allows one to choose from eight speed levels. The game defaults to a medium speed — while at speed 1, (the fastest), you need to be Superman, not Jumpman. Pressing a number from 1 to 8 at any time causes your next Jumpman to operate at the new speed. Up to four players may take part and the program will remember whose turn it is and who has or has not been eliminated.

The disk has no write-protect tab on it — with good reason because the program writes the top twenty scores, bonuses and player's initials away to the disk after each round. Next time you play, your friends can all have a good laugh at your previous pitiful efforts. Should you wish to wipe off incriminating scores, pressing the CLR key while the program is loading will ensure your recorded failures are erased for all time; you can start off with a clean sheet, if not conscience.

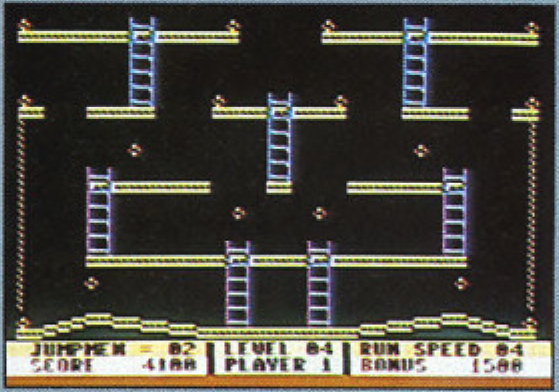
It takes only a few minutes' practice to get the hang of controlling Jumpman. Moving the joystick left makes him sprint westwards, right to dash eastwards, forward to shin up (a ladder, girder, etc), back to climb down again. Pressing the fire button causes him to leap vertically like the proverbial scalded feline and pushing the joystick either left or right while depressing the fire button will cause him to execute a balletic leap that would make Rudolf Nureyev tear his tights in envy.

Unfortunately for a superhero, Jumpman is not quite infallible. If you make him stroll off the edge of a girder, he will oblige and then plummet earthwards, bouncing painfully off any object that impedes his descent. Jumping gaps

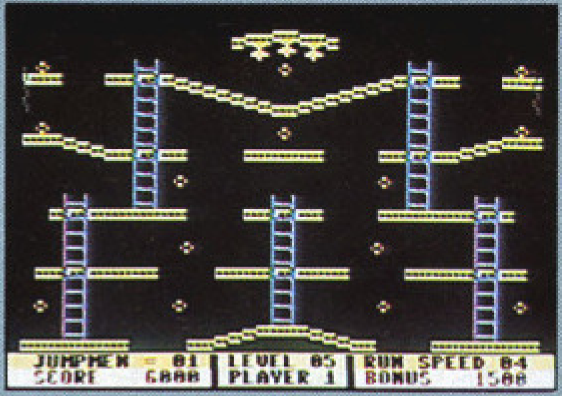
HOTFOOT



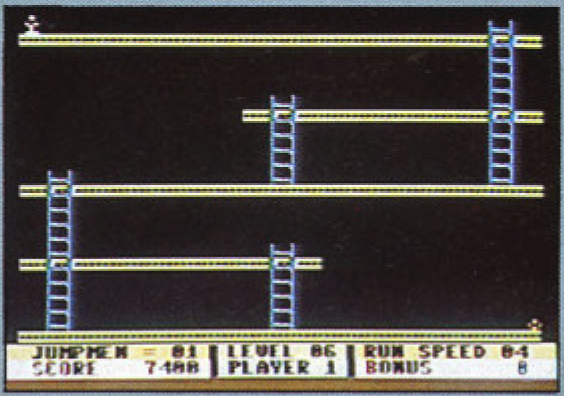
'Hot foot' is the second level of the intermediate stage — and it's one you'll soon learn to know, and hate. Not only do the bombs have to be gathered in a very specific and complicated order, but every time you make a jump the girder beneath you deteriorates, jeopardizing your progress when you return to that point. And if that weren't bad enough, the bullets — two of them at any one time — are particularly nasty. You'll be very lucky to get through this level without having to witness a burial at sea.



JUMPING BLOCKS This one's more infuriating than difficult. The nasties here move in the same way as the bullets (except there are far more of them), but instead of killing you they just make you jump — literally. This may be of little consequence — unless you happen to be on the edge of a platform, whence they will send you plunging into the abyss.



VAMPIRES In many ways this is the most difficult of the first eight levels — and the one where I tend to lose the odd member of my team. The vampires don't come for you until after the third bomb is taken but, unlike robots, these nasties are intelligent and know where you are; they come homing-in with their sonar. Don't let them come too near, and keep moving all the time; things get easier with . . .



INVASION You can relax, this level is easy. There's only one bomb to collect and the nasties are a few pink discs (of the alien kind) which pose little in the way of a threat. You have a choice — either go for a few points and shoot-up these innocuous beasts at a mere 25 points each (but as your bullets seem inexhaustible, an enormous number of points can be gained by the patient trainspotter) or you can just pick up the bomb and go on to . . .

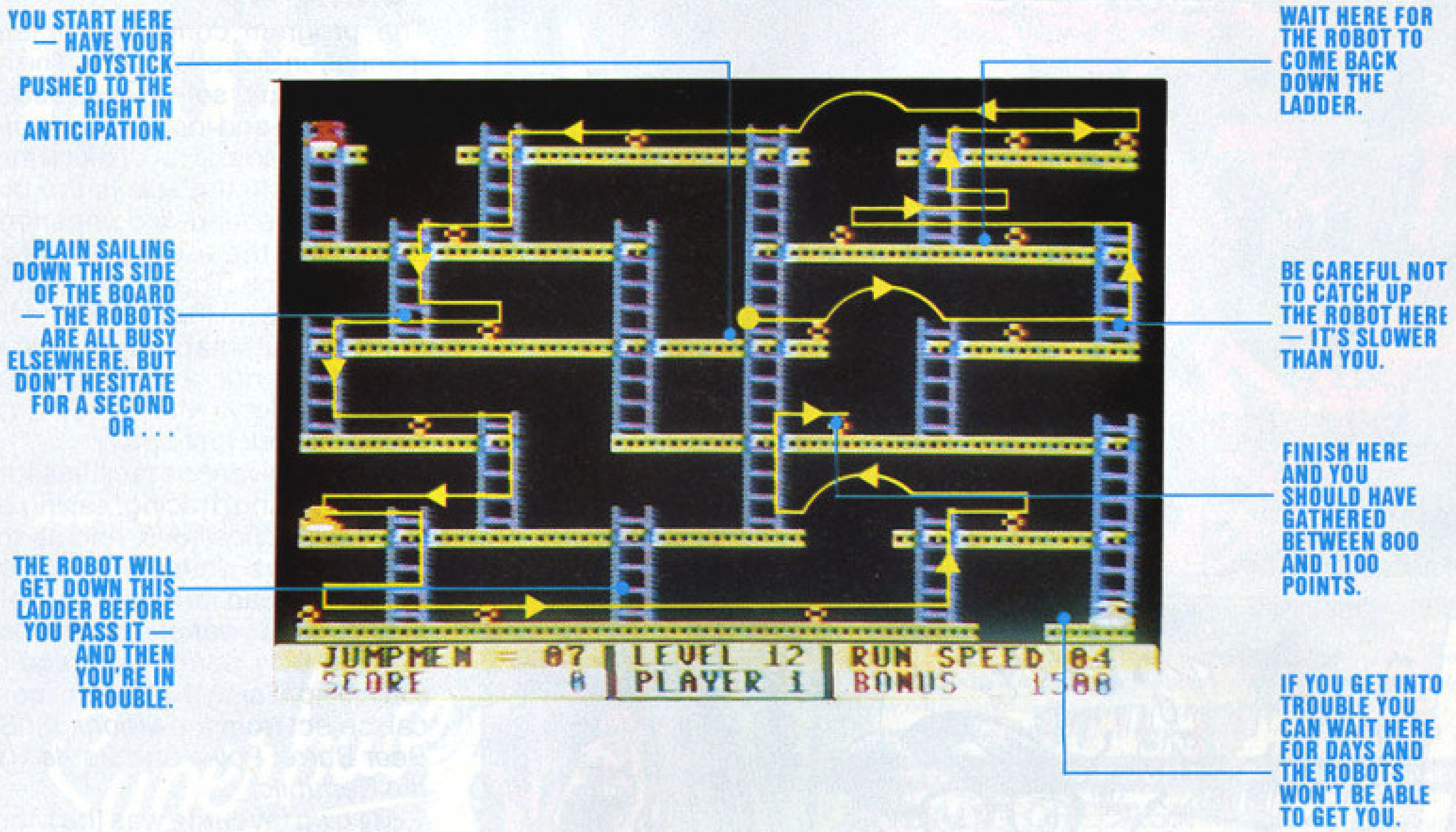
that are beyond his ability, tripping over, and leaping off the edge of the screen are similarly catastrophic manoeuvres. In fact you get some very funny animation as poor old Jumpman plunges to earth.

In addition to coping with ropes, ladders and girders, there are many other headaches. While every level has a different layout, it also has its own set of hazards. Each level is separately named and is read in from disk when needed, hence there is no cassette version. 'Bombs Away' has you dodging what appear to be World War One bombs — large, red, pot-bellied missiles with propellers on top. 'Vampires' has three sleeping bats which, one by one, take very realistic flight after you. 'Dragon-slayer' has you pursued by some Loch Ness nasties, with no obvious way of escape. 'Robots II' has four cute but lethal robots scurrying round the layout trying to trap you (the animation of these robots is lovely; I always end up laughing so much that Jumpman gets polished off in the mirth). 'Ladder Challenge' has a large swinging ladder on to which Jumpman must hurl himself; trying to stay put produces some hilarious effects, especially if our hero has a poor grip on the ladder. 'Figurit' is a puzzle — do things in the wrong order and you'll never finish. 'Watch Out Below' has the girders disintegrating while 'Runaway' has the bombs you are trying to collect float away like balloons. 'Freeze' has some dancing snowflakes which momentarily ice you up if touched. Nearly every level has bullets whizzing around — ammo which seems semi-intelligent, so you've got to have fast reflexes. And these are just nine of the levels; there are another 21 which include gunfighters, copycats, robots, grand puzzles, barrels, elevators, hailstones and other weird and wonderful challenges.

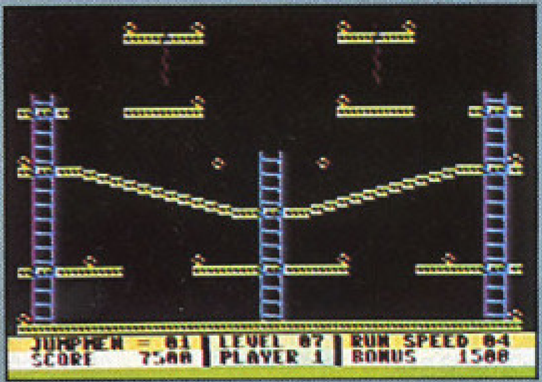
I'll Give It Foive

Jumpman comes attractively boxed along with a leaflet that gives clear playing instructions and useful hints on tactics. Overall it's a superb game — funny, challenging and tremendously varied. The animation is masterly. G 4

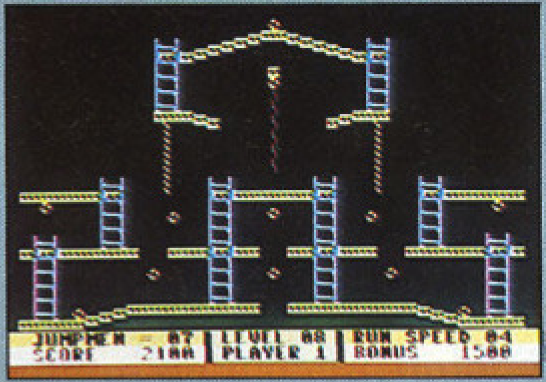
ROBOTS II



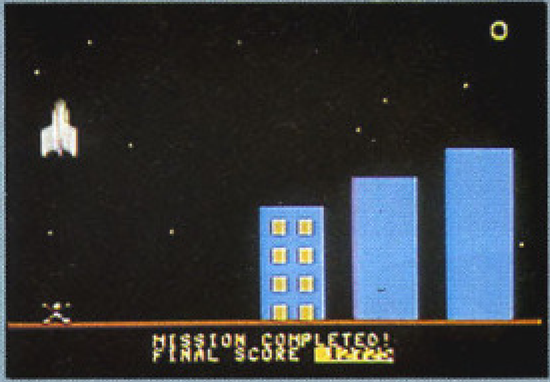
This is always the first level you'll meet on Randomiser, so mastering it is important. The robots may seem intimidating at first, but you soon realise that they are actually very thick — they always follow the same route, and they can't jump gaps.



GRAND PUZZLE 1 There are also two ways of approaching this level. The screen finishes when only four bombs remain, and each bomb is worth only 100 points — except for the four at the very top, which are worth 500 points each. But to reach these you have to build an extension on to the ladder; it might take you a while to figure out how to do it.



BUILDER This is not a very tough level — which is fortunate perhaps because at this stage you're probably jump-happy and in severe danger of blowing it. Four of the bombs and their supporting girder work are hidden and will only be revealed when the rest of the bombs are harvested. But the biggest problem is the bullets; they come two at-a-time now and are particularly vicious, giving a portent of the difficulties to be encountered.



THE BUILDING It'll probably take you hours and hours to become skilled enough to reach this. Some people who've owned the game for ages have still never made it. So, as one relaxes one's grip on the joystick and slumps back in the chair jubilant and elated, the thought slowly emerges that it's now 3am and you've just spent god knows how many precious hours of your all-too-short life — for this?

SOUNDS LIKE SYNTHY

To experience the full power of the Commodore 64's sophisticated sound chip, you need a more direct route than Basic. Bob Chappell *reviews Synthy-64 (written by musician Roy Wainwright,) which goes a long way towards letting you explore SID's symphonic potential.*



Although the Commodore 64 has powerful facilities for creating music, it only has two Basic commands (PEEK and POKE) with which to access and control them. Using these commands is both cumbersome and complex, and makes the resultant program listings extremely difficult to follow.

Synthy-64 has been designed to enable you to make full use of the 64's excellent sound capabilities in as simple a way as possible. It's a special interpreter which, when fed with simple statements representing a musical composition, will translate and execute them. The program thus enables the users to turn the Commodore 64 into a powerful music synthesiser, and spares them the pain of having to cope with the inadequate set of Basic verbs which the 64 has allowed for this purpose.

Tuning-Up

The program comes, complete with manual, on disk or cassette. The manual has separate set-up instructions for both media and installation is merely a matter of load and run. To kick things off the screen first displays the program logo — to sound accompaniment — and invites the user to try the sample compositions. These are held as one separate file on the media and the program will automatically load them in if selected. If not, a quick press of the Shift and C keys will have *Synthy-64* all ready for your first opus.

There are various facilities for building, amending, tracing, saving and reloading compositions. And as the program comes complete with sample music, you can immediately get some idea of the power of both the program and the 64's Sound Interface Device (SID) chip. Using the built-in menu, you can select from the *Moonlight Sonata, Beer Barrel Polka* and *Battle Hymn of the Republic.*

My own favourite was the Moonlight Sonata but the Polka was pretty impressive too.The Battle Hymn could have sounded better but, as if to make up for it, this demo also contains a Trace display, enabling you to see what's going on while that piece plays. Of course the Trace feature won't mean very much until you're familiar with the program's facilities.

Melody-Making

Compositions are built up like a normal Basic program. Each line of music is a line number followed by a series of commands and notes which are interpreted at run-time by the *Synthy-64* program. The composition can be amended simply by using the 64's screen editor, just as you would for an ordinary program.

A note is specified by a single letter, and modified by additional characters. A number following the note indicates the octave. Quarter notes, half notes, etc. are indicated by /n where n represents the fraction.

Thus C5/4 represents the note C, to

SOUNDS LIKE SYNTHY

be played in the fifth octave as a quarter-note. Notes which have no modifiers inherit the characteristics of the last modified note. Sharps and flats are represented by the addition of # or % to the note.

Other basic features include the ability to specify tied, dotted or triplet notes, rests, key signature, tempo and volume. Three voices are available and these can be used together to build up some tricky sounding three-part harmonies. *Synthy-64* does this by 'reading ahead' while playing the previous note and, if appropriate, it can start to play the next note before the previous one has finished.

There are a number of useful commands which can be embedded within your composition. In Basic, subroutines can be executed with a GOSUB command. Here, too, the same verb is used to play a sub-section of the piece before continuing from the point immediately following the GOSUB command. Each such sub-section is identified by its line number and terminated with the usual RETURN statement. Similarly, GOTO will jump to a particular line number and continue playing from there.

One particularly interesting feature is the special INPUT command. This takes the form INPUTA, B, C, .. If, when the composition is being played, one of these Input statements is encountered, the music will stop until the user types in a number. (The manual, by the way, refers to the user as the 'conductor' — nothing like a bit of flattery!). The program then behaves as if it were using an ON GOTO statement. Thus, if the command was INPUT300, 700, 800 the program would jump to line 300 if 1 was entered, 700 if 2, and so on. Any number outside the parameters causes the program to drop through to the next statement, again just like most versions of Basic.

Pieces of music can be made to repeat by enclosing them in square brackets. The number of repetitions required is the first entry within the brackets. This feature is similar to a FOR . . . NEXT loop and, just as those can be nested, so can repetition groups — down to a depth of 27 levels.

Other commands, for embedding within the composition, include: displaying text while the music plays (possibly useful for music teachers or, in a lighter vein, for a family sing-a-long!); loading a composition in from disk or cassette and playing it; placing remarks anywhere within the music (for annotation only); pausing for a specified number of seconds; and switching a TRACE facility on and off, the display showing which voice, note, etc. is being played. Unhappily, the trace slows everything down quite appreciably so the music sounds distorted. (It can be slowed even further by reducing the tempo with the appropriate command). If you try to compensate for the problem by speeding up the tempo, then the trace will be too fast to be of much use.

There are also a number of commands which can only be used in the direct mode — LIST, LOAD, SAVE and RUN a composition operate just like their normal Basic counterparts. Before composing or loading in a piece of music, the area of computer memory devoted to compositions must be cleared with a shifted C. Typing a shifted K will switch off *Synthy-64* and leave your micro ready for other work. You have to reload the program if you want to use it again.

> **"All the commands are short and memorable and I soon managed to get Synthy-64 playing simple tunes which, to my untutored ear, sounded pretty impressive."**

The program contains a number of commands for accessing and controlling some of the more complex tone generation capabilities of the 64's SID. The tonal qualities of each of the three voices can be controlled — qualities which are mainly determined by the sound's waveform. There are four such variables on the 64: Triangle, Sawtooth, Pulse and Noise. Other than Noise (which must be used alone) any of these may be selected either singly or together, and the result mixed.

One of the more powerful features of the SID is the ability to manipulate an envelope generator. Thus permitting full control over the nature of the sound. There are four elements to this, commonly referred to as the ADSR (Attack, Decay, Sustain, Release). Depending on the tone needed, there is often some delay in the build-up of a sound from silence to full volume — and this is called the Attack. By setting the Attack value, the sound can range from instant full volume to a longer and more gradual build-up. The Decay is the rate at which it drops from its peak, down to a middle-range volume. The sustain value controls how long the sound will stay at the mid-range volume before it drops to zero volume. Setting the Release value controls the speed at which the sound falls away from the sustain level. (For more on the subject, see this issue's 'Scratchpad'.)

By setting values for each of these four elements, you can control the shape of each sound to generate a wider variety of tones. *Synthy-64* has five separate routines already built-in and ready for use. These give the sound of a piano, flute, trumpet, banjo and accordion. The fun comes in creating your own unique instruments.

Other advanced features for more expert musicians are control over the filter frequency, gate, synchronisation and ring modulator. There are three further commands which allow you to set the filter globally for all three voices, and two commands which permit the sweeping of a tone up and down the scale in a smooth progression.

Composability

The package proved fairly easy to use, even for one as musically inept as I. I soon managed to get *Synthy-64* playing simple tunes which, to my untutored ear, sounded pretty impressive. All the commands and note symbols are short and, for the most part, memorable. I would have liked the program to have included some way of enabling the user to try out notes in the direct mode (i.e. using the keyboard as a crude musical organ). Unless you're Beethoven it's handy to be able to hear an approximation of the sound of the note before switching back and entering it into your composition.

Another useful adddition would have been the ability to translate the composition into Basic statements, to be saved for later incorporation into your own programs. However, this is a bit unfair since the program is already very good value for money and additional features like this would no doubt substantially increase both the complexity and price of the package.

The Backing

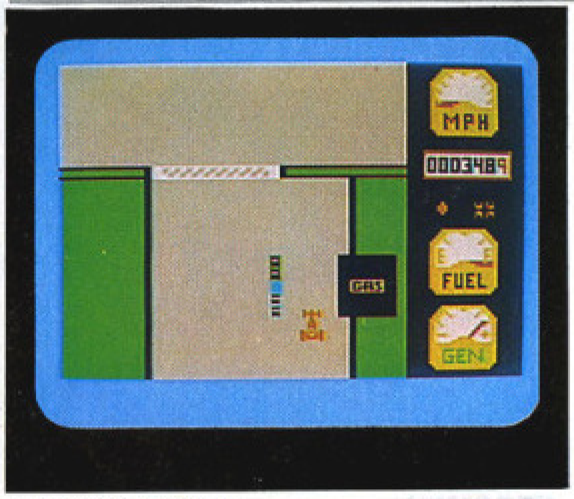
The only documentation is a small 40-page manual which gives simple but adequate coverage of the program's facilities. There are listings of the three sample musical pieces in the appendix and although there's no index, the layout makes it an easy matter to locate any of the commands.

Singing Praises

This is an excellent little program which greatly simplifies the problem of wrenching good music from the Commodore 64. It employs simple and memorable commands and musical notation and its use of a Basic-like structure makes it easy to get to grips with the SID's capabilities.

At only £8.95, the *Synthy-64* package has to be very good value for money. I'd recommend it to budding and blooming musicians everywhere. ■

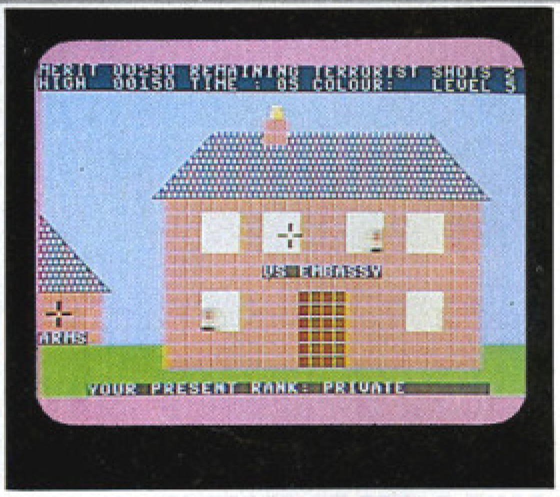
Synthy-64 is available on cassette or disk (£16.95) from Adamsoft, 18 Norwich Avenue, Rochdale, Lancs OL11 5JZ.



MOTOR MANIA
CBM 64/Audiogenic/£8.95

Thrills and spills as fast racing cars respond to the slightest twitch of the joystick by crashing into the barriers — or so one might reasonably assume from *Motor Mania*. It's tough on the track. The rally circuit is infested with avalanches, drunken rivals, glass, oil, logs and sand traps. It's nothing like motoring (although there again, last Sunday on the M1...) but it does seem to be an exciting challenge; it's one of those things that you look forward to being good at. The graphics are very nice and the sound's effective for providing feedback on how you're getting on at keeping to the straight and narrow — or not, as the case may be. The game is a kind of Monte Carlo Rally with just a touch of rally-cross thrown in for good measure. *GK*

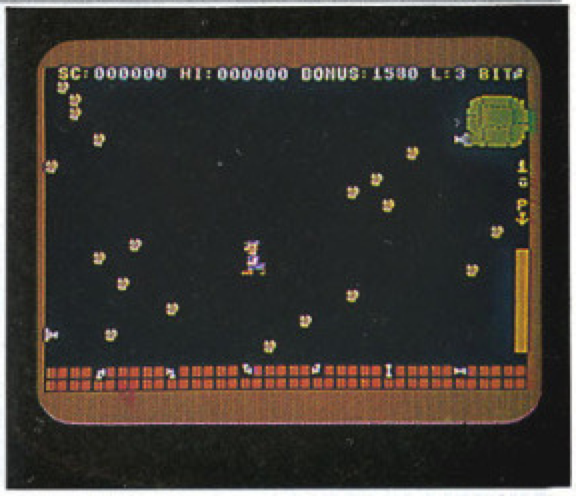
Verdict: Average but fun **(60%)**



WHO DARES WINS
CBM 64/DK'Tronics/£5.95

A little number that's loosely based on the goings-on at the Iranian Embassy seige, where you are in a pink house with five windows, past which flit coloured torsos. The trick is to decide whether they are terrorists or hostages before aligning the hair-line and pulling the trigger. Your weapon is limited to six shots only and while you're reloading, dozens of terrorists rush past the windows. Success is instantly rewarded by promotion, and failure by running out of time — or (if you shoot a hostage) by demotion. Overall it's a pretty exciting interpretation of the real-life event that gripped Britain for days. It's just a shame that the author never thought about the possibilities of being able to absail down from the helicopters! *SE*

Verdict: A compelling game **(85%)**

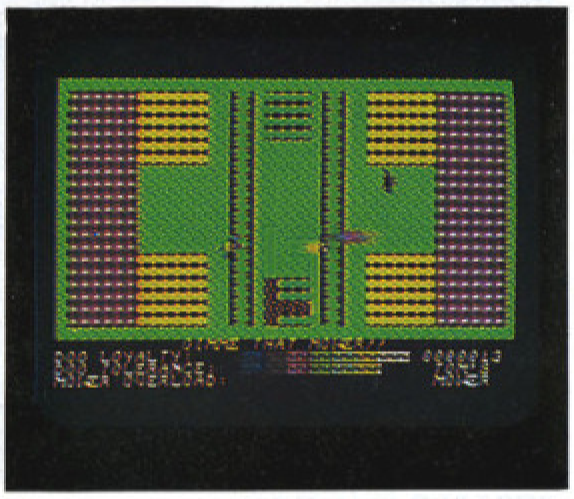


PLUMB CRAZY
CBM 64/Terminal Software/£7.95

Your mission as George the Plumber is to lay pipes from the bottom left corner of the screen up to the hard-pressed boiler in the top right, before it explodes. You collect any of six types of pipe pieces and use them to lay pipes around the intervening rocks. Each change of direction requires another trip to the store. One of the function keys calls up the spanner to remove wrong bits and another (only once per level) lets you dynamite offending rocks out of the way. As you progress, the timer on the boiler gets less forgiving and the rocks grow both more numerous and more awkward in their choice of position. And you also get attacked by ghosts. What they've got to do with pipes and rocks is beyond me — perhaps I should ask a plumber. SE

Verdict: Good idea, good graphics **(65%)**

43



HOVVER BOVVER
CBM 64/Llamasoft/£7.50

A latterday tale of lawnmowing. You start by purloining Jim's Air-Mo so that you can cut 16 lawns. Jim doesn't take too well to this and sets off in hot pursuit across the grass; the chase is on around the flower beds and hedges. You set your trusty dog, Rover, on to Jim to try and keep him away. However, the unfortunate thing is that you tend to plough through flower beds — and promptly find an angry gardener joining in the hunt. Rover gets fed up with the noise and stupidly starts biting at the lawnmower; he runs away yelping when you accidently give him a haircut. And if all that weren't enough, the Air-Mo starts overheating... This is vintage stuff — probably the funniest and most original game in ages, with superb graphics, sound and concept. *BC*

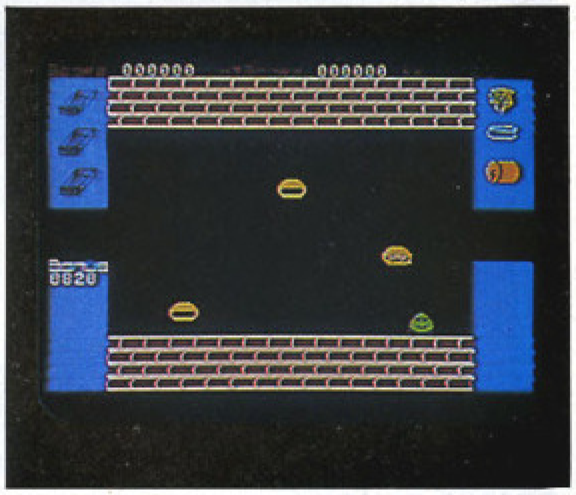
Verdict: Just excellent **(90%)**



CHINESE JUGGLER
CBM 64/Ocean/£6.90

Ocean is getting quite a name for itself for 64 games — and this one helps prove why. The screen is the stage of an old theatre, complete with curtains. On it you control a figure that really does look like a Chinese Juggler. All you have to do (ha!) is put up and keep spinning eight plates on the bamboo poles. At each level the colour of the plates determines both their score value and the ease with which they may be kept spinning. This is a classic case of a game where cool heads win through. Despite rushing around like a headless chicken you only have to miss your place by a fraction and you can't make the plate spin. If you ever wanted to justify buying a game because it'll improve your hand-to-eye co-ordination, this is it. *SE*

Verdict: Clever and original **(65%)**



MR WIMPY
CBM 64/Ocean/£6.90

Far be it for me to question why a tie-up with a burger outfit should benefit a computer game, but I can't see why Wimpy should choose any game to give its official sanction. On the other hand, playing the game has given me a better understanding of why Wimpys are always cold when they reach your plate. First you scoot around the screen avoiding a little chap called Waldo and three man-eating manholes (that look like burgers) to collect the three ingredients — bun, beef and cheese. Then you have to actually make the burgers, despite the attention of the kitchen rebels. Your only weapon in this war is pepper and you've only got three shots unless you collect the bonus goodies which might be gems, coffee or ice cream. All good stuff. *SE*

Verdict: Above average and fun **(65%)**



QUINTIC WARRIOR
CBM 64/Quicksilva/£7.95

Here's one that's really up to Quicksilva's usual standard. The only thing is that the cassette insert leads you to expect something completely different. My 'warrior' could have been anything from a Harrier to a Lunar Lander and the 'mutants' look more like dumpy tuning forks. But all that apart, the game really is highly addictive and it manages to strike that rare balance between being a challenge at higher levels, without being too difficult at the lower ones. Trying to zap the mutants as they advance up the grid, while avoiding the laser guns firing across and up at you, is bad enough; but at the same time, various allies of the mutants strike from the rear. It's one of those games that you can happily wear yourself out playing. *SE*

Verdict: Good for sharp reactions **(70%)**



FOUR GATES TO FREEDOM
VIC 20/Phoenix Software/£9.99

Some captured scientists are being held prisoner by the evil warrior ants on the planet Xzinos, and it's the player's mission to try and set them free. The program comes supplied on two cassettes, the first of which turns out to be an arcade game. Successful completion of this will lead you on to the adventure, though before that happy moment you have first to blast your way through two walls and then open up the gates. As each skill level is overcome, a vital clue is given to help you finally complete the adventure. Mastery of these four skill levels will provide all the various clues necessary, not to mention the running code that's needed to play the thing. Actually, it's a rather interesting new game concept. *JD*

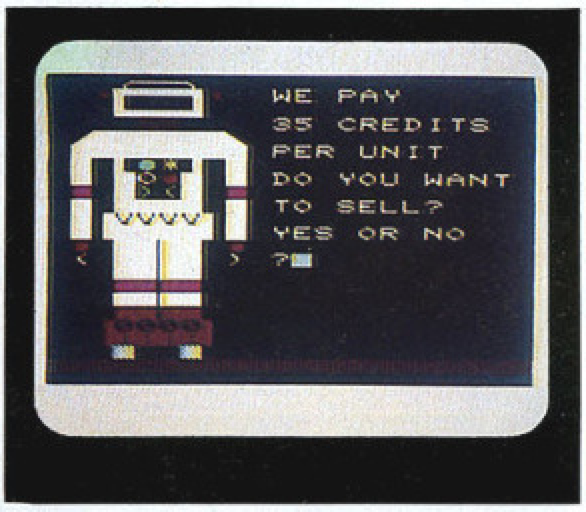
Verdict: Good idea gone bad **(50%)**



NEOCLYPS
CBM 64/PSS/£7.95

I like games where you get to blast lots of enemy spaceships. I like having good scanners that you can call up to tell you how you're getting on. I like flying across the screen in search of hordes of on-coming flitters. And I also like good graphics. So I'm hopelessly hooked on *Neoclyps*. The game is very loosely related to *Scramble* and *Star Trek*. Your mission is to see off the bad guys who live in radar towers and space ships. The towers are in four areas on each level and are hidden among buildings. Zapping a flying baddy gives you four seconds of screening during which time you can fly through buildings (use your imagination!) and get 'em. When you've cleared one level, you move on to the next, more highly populated, one. *SE*

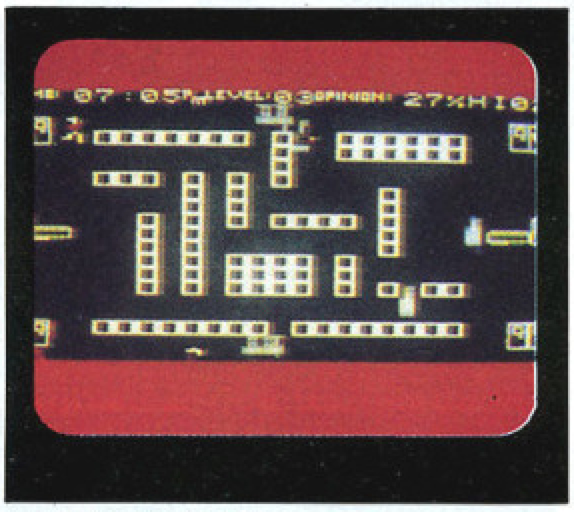
Verdict: Very addictive and great fun **(85%)**



TRADER TRILOGY
VIC 20/Quicksilva/£14.95

Starting with a ship and 1000 credits, our would-be Paul Getty buys various commodities. Over the three parts of the game, you proceed through the five planets in the Meridien System to encounter inhabitants ranging from Psions who live on brainwaves to Deltans who live on Boosterspice. Unless you are able to answer the question of the Psions, they will snatch away your precious cargo. Hazardous landings are the order of the day and to make lots of money selling Boosterspice, you face the minor preliminary of negotiating the maze of the Deltan city. If you manage all that, then finally you return home to do what you will with your hold full of hard-won cargo. Overall, the adventure offers both variation and good graphics. *PJ*

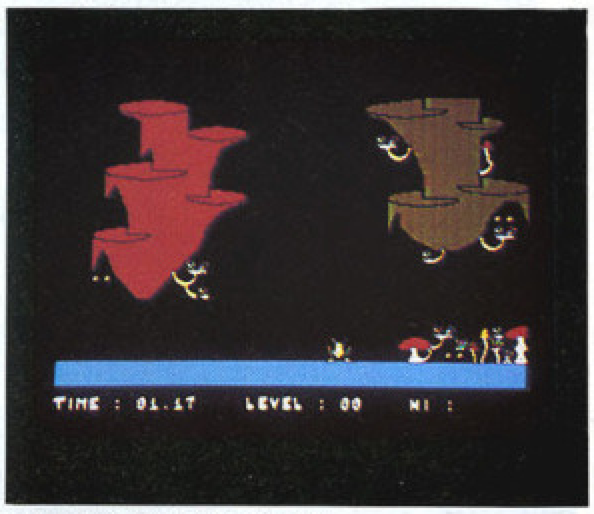
Verdict: Ingenious and absorbing **(80%)**



CATCHA SNATCHA
VIC 20/Imagine /£5.50

Sorry but it's the same old story... good packaging and a great idea are a little let down by the game's execution. As Barney Bootlace, store detective, you operate in a maze-like department store, ferrying lost property and abandoned infants to the appropriate offices and keeping an eye on shoplifters. And not only that, the occasional terrorist even leaves a bomb or two for good luck. Carrying out your duties will result in your riding high in the manager's esteem — promotion can ensue. Failing in them results in written warnings. For most of the time your work is cut out just recognising objects and catching thieves. Watch out for the 'rush hour', however. This one should appeal to kleptomaniacs everywhere. *MR*

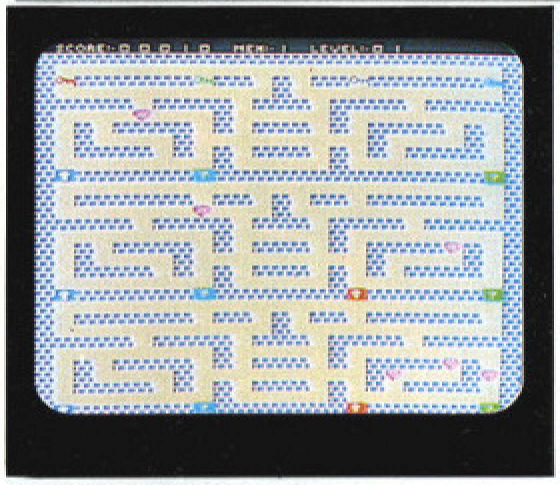
Verdict: Good fun for a while **(65%)**



BUGABOO (THE FLEA)
CBM 64/Quicksilva/£7.95

The quality of graphics on this program have to be seen to be believed — certainly they go a long way to make up for the frustration you feel as you begin to discover just how difficult a game it is to play. Using a joystick helps a bit, but it's still hard to judge the on-screen power-bar well enough to make a jump of the right strength. There seemed a high correlation between the well-judged jumps and the times I ended up in a dead end with the only way out being back down. In this game you win by going up. And while you're in the middle of mastering all that, along comes the carnivorous dragon (sounding like a police car with siren) to eat your little nipper — so to speak! I just developed a hatred of dragons and a total disregard for fleas. *SE*

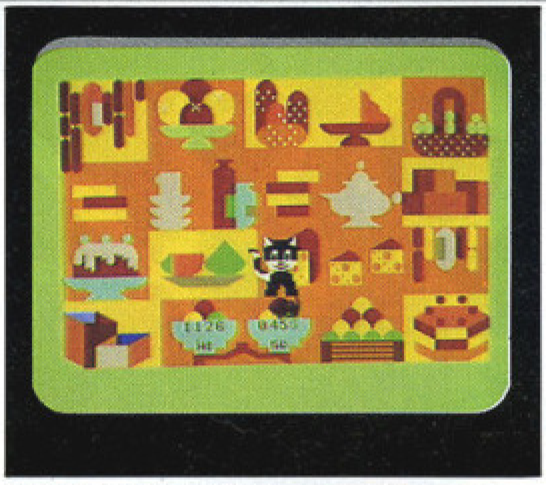
Verdict: A good idea, well executed **(75%)**



BEWITCHED
VIC 20/Imagine/£5.50

At last now we have it, a game from Imagine that's both playable and very addictive. In essence it's a journey through a maze that involves in this case the unlocking of doors and avoiding the ghosts. The screen shows the maze divided into three sections. The two lower ones are blocked by four locked doors, each of a different colour. They can only be opened with the key of the appropriate colour, which you'll find located at the top of the first section. And to make matters even more complicated, the bad news is that only one out of each of the four locks actually opens a door and it's your task to find out which one that is — by trial and error. Overall, it's a good try and very addictive, even though you'll find you need a lot of practice. *JD*

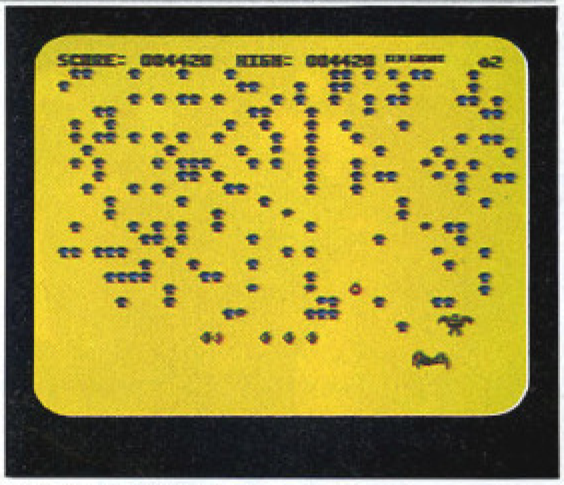
Verdict: One that grows on you **(65%)**



CAESAR THE CAT
CBM64/Mirrorsoft/£8.95

Attention all moggy lovers, Caesar is a cute little black and white kitten whose aim is to rid the 'larder' of mice. The larder is in fact a screen packed with food and crockery. The naughty mice scamper around eating food until Caesar catches one of them. Then, a door opens on the edge of the screen and Caesar has to take his prey outside. If the cat knocks into the side of the screen or any of the crockery gets knocked over, then points are immediately lost; and come to that, points are also lost over the time you take. The second and third levels move you along to much faster, and more valuable mice. There's no other game I've seen that I could really compare with this for novelty — even dog lovers will like it. *SE*

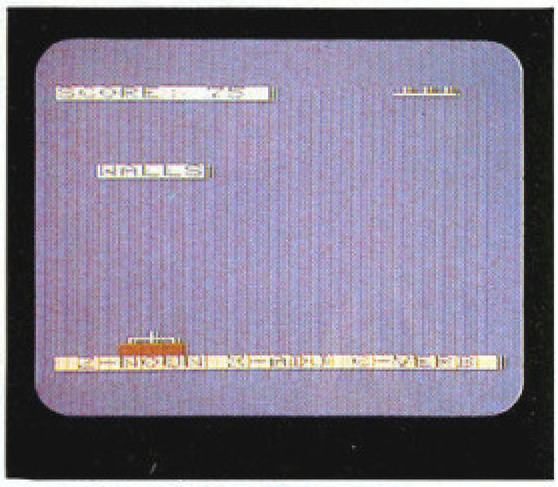
Verdict: Fresh concept. **(85%)**



EXTERMINATOR
CBM 64/Bubble Bus/£5.95

The arcade game which attracted me most in recent years has been *Centipede,* purely because of the mesmeric effect of that string of segments winding its way through the maze. Well, fans of that will be happy to hear that *Exterminator* has all the attraction of *Centipede* and a lot more besides. In addition to the centipede-like creatures, you are pitted against a mad eagle, a huge tarantula, dive-bombing mosquitoes and a truly gross white scorpion. Full and impressive use is made of the 64's sprite facility, the spider being particularly life-like. Each creature has a different kind of sound effect too. The game offers well-paced action, which becomes frantic at the higher levels; once you're sucked in, the result is addictive. *DP*

Verdict: High level compulsive action **(80%)**



ENGLISH INVADERS
VIC 20/Rabbit Software/£5.95

At last, proof that intelligent life exists in outer space! All those relentless invaders that we've all got so used to have been banished, and replaced by a new deadly enemy which bombards the Earth with, wait for it, nouns, adjectives and verbs. Only the intelligent will survive since each type of word can only be destroyed by a particular weapon. This game is for children and is good in helping to identify different components of our language. However, it's let down by poor execution. Altogether the player is required to use three fingers on the left hand to shoot down three types of word, and two on the right to move the gun. Another mild criticism is that some words appear which are both noun and verb (for example, 'leap'). *JD*

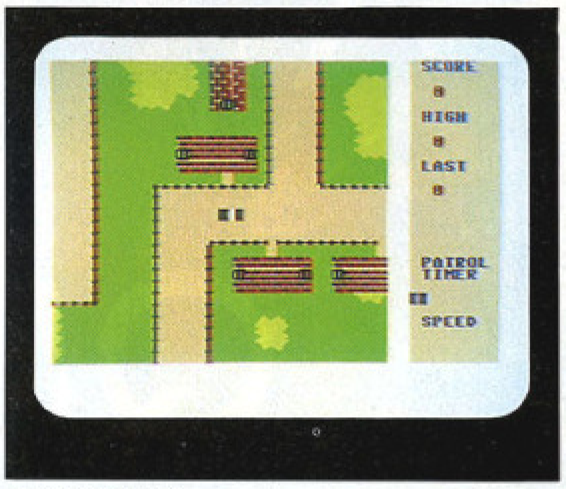
Verdict: Fun, and possibly effective **(60%)**



REVENGE OF THE MUTANT CAMELS
CBM 64/Llamasoft/£7.95

I, like a million other people, really enjoyed *Attack of the Mutant Camels.* Up to this point I'd yet to find a Jeff Minter game that wasn't exceedingly clever. So I set out *not* to enjoy this game out of sheer spite — and failed abysmally. You have to be weird to go on about llamas and camels like young Minter, but you've got to admit that when you're faced with a shielded, death-spitting camel and the prospect of knocking the unmentionable out of so many strange objects, there's something that gets you right where it counts. I particularly liked having to vault phone boxes while blasting away at moving CND badges intent on my destruction. I'm just glad that the random option gives you a chance of seeing any of the first 32 levels. *SE*

Verdict: A classic follow-up **(90%)**



SIREN CITY
CBM 64/Interceptor Software/£7.00

Certainly one of the more original concepts to hit the screens lately, *Siren City* is a game you can really get your teeth into. You're a New York cop driving a 'black and white' and the 10 levels take you from just driving around the precinct while avoiding buildings and cars through to capturing villains in helicopters armed with bazookas. The graphic representation of city blocks from the air is very neat — although it's let down a bit by the jerky scrolling. Using the joystick fire button to turn through right angles means you can execute some really stylish handbrake turns — and to be truthful, I could only manage it when the chief meanie was snapping at my ankles. Overall, it's a game that's good partly because it stands out from the crowd. *SE*

Verdict: A good, imaginative concept **(85%)**



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BUZZ WORDS



Ear to the ground, micro-cassette in hand, Y64's Ron Smith probes the software houses of Britain in his search for news of upcoming releases.

Romik Boils Up

A new program from Romik Software, one based on the original 'invaders' arcade game theme, is being worked on at this very moment. It's provisionally being referred to as *Antics*, and the object of the game is apparently to protect your vegetable patch from the hordes of invading 'creepy crawlies'; you have to drown them with your hosepipe — or was it blast them with your laser? Personally I can't wait — yawn — it sounds like one of the most original ideas I've never heard (Zzzzz).

However, not all future releases may be has lively as this one, because, says Romik's Mike Barton, "one of our contacts is sending in five or six new programs soon". So... What are they like? "I can't really comment, because I haven't seen them yet". Dynamic stuff, eh? Is it this kind of imaginative approach that's leading Britain to riches anew?

Romik is also working on a graphics design package that will help the user to make use of the 64's sprite graphics. Keep an eye out for that one, it should be around sometime over the next few months.

Quicksilva Conversions

Most of the software houses who've always supported the Commodore 64 are only just beginning to see it as a major machine. And now they're finding it a problem, trying to meet the demand for new games.

Quicksilva, for example, is not only planning to convert some of its best-selling Spectrum software (at the moment the company's keeping *schtumm* as to which ones they are), it's also working on 64 versions of the New Generation games. Presumably though, this is only a stopgap until new ideas come along. For instance, Quicksilva's Mark Eyles says, "we're doing a lot of work on 64 software; there really is a lot more on the way. We'll soon have as many programs for the 64 as we have for the Spectrum".

Carnell Knowledge

Carnell Software, according to spokesman Simon Bassett, also has "plans for extensive 64 software development in the future." At present the company's working to bring us *Black Crystal* and *Volcanic Dungeon*. These should be available sometime in June or July. Further away, however, is *Wrath of Magra* which won't be available until just before Christmas. According to Mr Bassett there are "two programmers working on the project." You never know, it may even be something quite spectacular.

Rabbit, Rabbit

Rabbit Software's Terry Grant, who just happens to be the director in charge of deciding which new software will (or will not) be published, tells us about one of the company's latest ideas. It's a program called *Stalag 1*, where the player takes on the role of a commandant in a Nazi prisoner of war camp. It's his job to keep those tiresome prisoners from escaping and of course it's never as easy as it seems, because all the time a little dog is snapping away at his heels and holding him back from his duties. Sounds tasteless, but fun.

Terry insists that Rabbit's the only software house to be run entirely by lunatics, but adds: "that's not quite true, I forgot Salamander Software. But they're all over 50. They're the only company where the directors are collecting their old-age pensions". Perhaps Salamander would like to respond to this insult?

Mr Chip Chatter

Ever since a certain psychopathic slaughterer terrorised the ladies of the night who walked the streets of Whitechapel, there's been a sustained, if somewhat morbid, interest in his past doings — not to mention considerable curiosity as to his identity. With this in mind, Mr Chip's Doug Braisby decided to computerise the whole ghastly episode; predictably, the epic is to be entitled *Jack the Ripper*. It's being written by the programmer responsible for *Westminster* and *Red Alert*, both also from the house of Mr Chip.

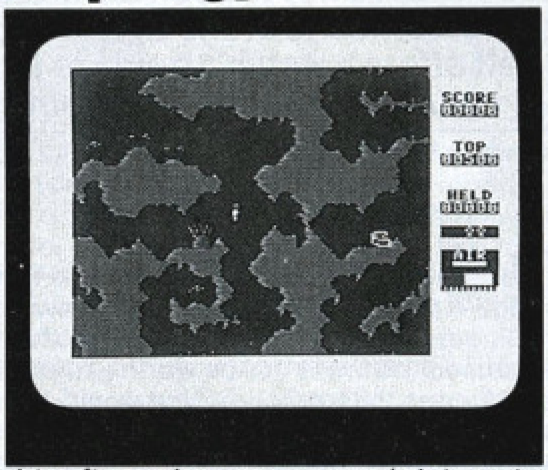
The object of the game will be to track down the deadly Jack and bring him to justice; the player takes on the role of detective. But in fact more than one player can take part — "it'll be able to accommodate up to four, each playing against the others instead of against the computer" claims Doug. And with the promise of 'original locations' being featured, the idea could be a bit of a winner.

Brainsby, however, seemed strangely reluctant to give away the name of his programmer. He told us the program was being written by Orion Software, and that the programmer — a certain Mr Blunt — didn't want his name known. Oops, sorry! Still, a reluctant star has been identified, which is more than anyone ever managed with Jack the Ripper.

Boots Goes Floppy With RSS

With the relatively low cost of (plus rising interest in) floppy disk drives, Richard Shepherd Software has decided to convert five of its most successful titles to the floppy medium. These will be *Ship of the Line, Everest Ascent, Super Spy, Transylvanian Tower* and *Urban Upstart*. So what had prompted this decision? A spokeswoman told us: "Boots has just confirmed that they will take them, and the disks will be available in all of their 50 micro stores". Word has it that RSS is beavering away with enthusiasm.

Durrell Apology



If you thought software houses were only interested in making a fast buck, and concerned themselves rather less with the quality of their product, then Durell software has news for you. Robert White told us: "Our *Scuba Dive* program on the 64 is really awful. We're terribly embarrassed about it and the programmer responsible probably won't be working for us again". Welcome words and, unfortunately, an accurate assessment to boot. He went on to explain that Durell is striving to produce software of a high quality, and that any drop in standards could affect the company badly.

A HOT COMPRESS FROM LEVEL 9

Whose plight can be more miserable than that of the Adventure lover who does not own a disk drive? What more galling sight than Adventure programs advertised with those dread words 'Disk Only' beside them? Now, lift up your collective peckers, poor wretches, for Bob Chappell *has news that will turn your sufferings to joy.*

Any good Adventure should contain large, detailed descriptions of locations, objects and incidents. The trouble is that text gobbles up memory at an alarming rate. The Adventure writer is normally faced with two options: either to drastically prune the text so that the whole program will reside in memory at one time or to design it so that chunks of text are swapped in and out of memory as required.

Adopting the first option means that the response time of the program will be fast and the program can be loaded from cassette or disk. The drawback is that the textual detail is likely to be pretty threadbare since the whole thing is governed by the amount of memory available. The second option has the advantage that fuller descriptions can now be used, but since this means regular random access to pages of text, it has to be stored on disk, thus slowing down the response time and worse, restricting the program to disk owners only. Not what you'd call fair.

There is a third option and Level 9 Computing has seized it with a vengeance. It's used a clever text compression technique, combined with a compact special-purpose low-level language, to give the user large scale and fully detailed Adventures. These are read in from cassette and reside totally in memory. This onslaught has produced Adventures which have a fast response time, are spectacular in the amount of detail and number of locations, and are available to cassette owners. The company has achieved what most would have thought well-nigh impossible: a complete full-scale version of the classic Crowther and Wood mainframe Adventure, *Colossal Cave*, that runs happily on a micro. What's more startling, the authors have even found room for a whole new ending — an extra 70 new locations, the endgame continuing where the original finished. Level 9 has also published two other, equally large-scale, Adventures, and a further one is under development.

As in all Adventure games, the aim is to explore, solve puzzles, collect treasure and, above all, survive. Each Level 9 Adventure has over 200 locations to find and investigate so there's a lot to do. Don't expect to finish a game in a few hours; it's likely to take you weeks, possibly months.

Responding to the program's request (WHAT NEXT?) for an input is by the usual method of short phrases, normally a verb and an object — for example GET BOTTLE, DROP SWORD, GO EAST. Movement can normally be abbreviated to one or two letters, for instance E for GO EAST and NW for GO NORTHWEST. Special single word commands such as INVENTORY, SCORE, SAVE, RESTORE and QUIT can be used. It's up to you to find out what others there are. The Adventures don't run in real-time so you don't have to rush your decisions when the program is waiting for an input.

Three — Way Action

The three Adventures currently being published by Level 9 are *Colossal Cave, Adventure Quest* and *Dungeon Adventure. Colossal Cave*, to repeat, is a classic, possibly one of the best Adventures ever written. However, to tease those already familiar with it, Level 9 has moved one of the treasures and hidden a vitally needed object. Apart from this — and the extra 70 rooms in the endgame — it's a completely faithful implementation of the original.

Colossal Cave is set in a massive underground world where a variety of hazards and challenges awaits you. With over 200 locations to find and investigate, it'll take some while just to

THIS WAY FOR ADVENTURE

For those who've never been blow-torched by a dragon or turned to stone by a wizard, Henry Budgett *offers a victim's guide to the perils and pleasures of playing adventure games.*

You're standing in a forest clearing. Shards of sunlight fall on the scorched grass around your feet bringing a touch of life to the shattered surroundings. A smell of brimstone lingers — whatever caused the fire, it was recent. Among the trees there is a strange absence of life; it's as though the animals are watching to see if you are friend or foe. Paths lead both North and South from the clearing. An axehead is buried in a treestump, the handle all burned away.

To anyone who's ever played an adventure game the above, part of an as-yet-unpublished program, will be familiar enough stuff. Seasoned adventurers would probably seize the axe and continue the journey after carefully making a note on a map that a new location had been visited which may well be worth a future look. The novice would probably wonder what on earth was going on and hang around long enough for the Dragon (for it was he who set the blaze) to come back and be roasted to a proverbial crisp!

Adventure games are as different to arcade games as chalk is to cheese; no lightning-fast reflexes needed here, well not often, but more a slow and methodical progress through the many locations or 'rooms' that make up the fabric of the fantasy world the author has created for you. Adventures can be set anywhere — past, present, future, real or fantastic — but they all share various common elements. In the main, at least until a couple of years ago, adventures consisted solely of textual descriptions. These had their origins, not in such mainframe giants as *Colossal Caves* but with the role-playing humans who took part in *Dungeons and Dragons* and other fantasy games of that ilk.

The computerised adventures follow the same basic idea. You take the part of a character in the game and search through the various rooms and locations trying to find treasure or helpful items whilst avoiding traps and ravenous beasties. The most common pitfalls built into these games are the set-piece mazes, although at times it seems as though the whole thing is a maze. Here the normal rules of logic break down; going North and then taking a path South doesn't necessarily put you back in the place you started from! It's here that logic and careful mapping of your route pays off, sheer good luck often helps as well...

The latest craze in adventure games is that they must contain full graphic displays of the locations. The first to achieve this in a big way was *The Hobbit* although even here only the crucial locations were illustrated. More recently we've seen games like *The Dark Crystal* (based on the cartoon film of the same name) and *Valhalla*. Interestingly, the later games have drifted so far away from the original concept that programs like *Atic Atac* and *Forbidden Forest* now resemble arcade games far more than adventures.



INGRAM PINN

build up your map of the land. Indeed, it may take some effort just to find the entrance to the Colossal Cave since you start above ground. Points are awarded for collecting treasure and returning it to the Well House. There's a maximum score you can reach — which isn't easy to attain, since there are parts of the underground world so cunningly located that you'll need all your wits to get at them.

There's quite a bit of humour in this Adventure and part of the fun is trying out different approaches to a problem to see what will happen. If you get killed (though it's not a savage Adventure), there's a good chance of being brought back to life in a puff of orange smoke — provided the program hasn't used it all up. There's a Save and Restore feature which enables you to save the position you've reached within the Adventure for later restoration. This is very handy to use just before you enter a particularly uninviting cavern; if you get polished off, you can always restore the previously saved position and try to kid yourself it never really happened!

When you end a session, you will be told your Adventurer rating — and after a hazardous 3 hours exploring, it's a bit ego-deflating to be told you're only a Novice Adventurer. To become a Grandmaster, you need the maximum, which you won't get if you've used Save, Restore or been killed in the current session.

Adventure Quest has 255 individually described locations and a large number of problems to challenge you. You are an apprentice magician selected to seek out and defeat Agaliarept, a Demon Lord residing in the Black Tower. Before you can even gain access to the Tower, you must first find the four Stones of the Elements.

Dungeon Adventure has well over 200 locations, 700 messages, around 100 objects, and puzzles aplenty. What would you do with an exploding poppy, a cuddly octopus or a dice that always

LEVEL 9

came up 6? Seeking the treasures of the Dungeons will bring you up against these and many more.

Snowball under development (at the time of writing), may be released by the time this review appears. It is set on board a gigantic spaceship which contains 8000 rooms — no that's not a typing error, it really does have eight thousand! Fortunately, your on-board computer will help you to whittle your visits down to a mere 200 of them.

Compressing It

I must admit that when I first heard of Level 9's claims, not a small amount of scepticism entered my normally trusting soul. Having now seen and experienced its Adventure programs, I am extremely impressed (and suitably contrite!)

Without revealing too many trade secrets, I can tell you something about the methods Level 9 uses to accomplish this astonishing feat. At the heart of the company's design methods is a purpose written 'data compiler' which compresses text by a ratio of at least two to one. The compiler scans all the text to produce a list of 127 most common letter groupings. Each of these groups is then coded as a single byte. An embedded translator (miraculously, only ten lines of assembler!) expands the compressed text using the stored list for reference. The translation and text expansion is done at such a rapid rate that there's no significant pause between the user entering an input and the program displaying the full textual response on the screen. In addition, each program contains about 4-5K of super-compact 'A-Code' and a further 1K of machine code, the latter being a commom core for each type of micro. The A-Code consists of 1 byte long instructions to run and control the Adventure. It was specially designed by, and is unique to, Level 9 for its Adventure programs. The end result is that the whole program, including all text, fits completely into memory.

Background Stuff

Loading takes about ten minutes — and this is the only waiting you'll have to do. The tapes used are of high quality and I experienced no loading problems. The programs run very fast and there are no frustrating pauses while you wait for the computer to respond. I never managed to crash or find bugs in any of the programs, and all are simple to operate. Not a single spelling mistake or grammatical error could I find — what a pleasure to find Adventures that are literate. The 'Home Cursor', 'Clear Screen' and a few other non-text keys are not trapped on input but this is a minor flaw. There are one or two small inconsistencies between the three Adventures but taken either individually or together, they are simply superb.

Each Adventure comes complete with a neatly presented 8-page booklet. This covers background to your adventure, loading and running, instructions for playing (with examples), scoring, and some general hints. There are no instructions as such within the program, thus sensibly using the space for just the Adventure itself. Level 9 is obviously a considerate company; as a particularly nice touch it includes an envelope, stamped and addressed to itself. If you get really stuck trying to solve a particular part of the Adventure, the SAE entitles you to one free clue direct from Level 9. Don't, however, expect to get a detailed answer to a question like "How do I get all the treasures?"!

Final Eulogy

The Level 9 Adventures are superbly designed and programmed, the content is first rate. The implementation of *Colossal Cave* is nothing short of brilliant; rush out and buy it. While you're at it, buy their others, too. Simply smashing! 6 4

Price £9.90 available from Level 9 computing, 229 Hughenden Road, High Wycombe, Bucks HP13 5PG. Telephone 0494 26871.



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S C A R Y
MONSTERS

At first sight Forbidden Forest *appears just to be another adventure epic in the best 'Dungeons and Dragons' tradition. Needless to say, it isn't. As* Stephanie Brittain *reports, it's a novel arcade game with roots that stubbornly refuse to trace back to an ancestry of* Pacman, Galaxian, Invaders *or* Missile Command.

Before looking at the end result, let's focus in on how the game is likely to reach you. The original producer is an American outfit called Cosmi that in turn has granted Audiogenic of Reading the rights to market its games in the UK. In fact *Forbidden Forest* is one of six games currently being offered by Audiogenic, of which we have so far seen but two others — *Slinky* and *Aztec Challenge*.

As with most US games, the usual format is disk although apparently plans are afoot to offer the series in cassette form. The review copy came in packaging that's reminiscent of those early Atari games cartridges, and although the documentation is adequate it still doesn't really measure up to the standard shown by what turned out to be a very high-grade game. On the other hand it's only fair to add that all the questions I felt moved to ask were duly answered.

The program itself consists of 28K of machine code and takes about two minutes to load from disk — the cassette version would naturally take a day or two longer. And despite the size of the program there are no options for a second player; no doubt a considerable amount of the code space has been hived off to produce the splendid forest effects.

Having blundered into the Forbidden Forest you're suddenly surrounded by trees and armed only with your trusty bow and five quivers of 10 arrows; at high levels (there are four altogether) your arrow supply comes under ever more strict rationing. Alternate presses of the joystick fire button load and fire the bow. If you don't load it, you can't fire it — obvious except when you're staring down the throat of the Demogorgon (our arch meanie).

The distinguishing features of the scenario depend a lot for their effect on what is lovingly described as four-dimensional action. What this really means is that as you progress around the forest it gets dark and the sun is

A TALK THROUGH THE BLACK FOREST

The documentation warns you that you're going to regret entering the Forbidden Forest and after a few minutes you'll know exactly what it means. And all you get to fight back with is a bow and arrow!



1 **Thankfully the spiders are quite slow-moving and easy to hit, which is just as well as it takes a while to master the load then fire technique. It would help if there was some way of telling when the bow has been loaded.**



4 **Now here's an all-too-common sight. Having failed to skewer the dragon as he appears at the side of the screen, it's time for our bow-bearing friend to demonstrate the meaning of 'frying tonight'.**



5 **While the skeletons can kill your bowman (and you can kill them) it's the fellow at the back that you've got to hit, square in the face, if you're going to get on to the next level.**

replaced by the moon and stars. When you add this to the multi-layered sprite graphics — which give such a great depth and feeling of perspective to the game — you begin to get the feel of how different *Forbidden Forest* is to any games short of the *Ant Attack* or *Bugaboo* level of current releases. And it's not only good looks that steal the day; duelling the seven levels of monsters has a zing all of its own.

The art of good bowmanship takes some nifty finger work. You keep the joystick over to one side to enable the bow to reach its full traverse; holding it there makes our hero run in that direction. Vertical elevation is indicated by bars on the side of the screen which only appear when you change the degree of elevation; they're not there when you're keeping still. Sounds tricky, and it is. Don't let the glib bit in the manual tell you otherwise.

Enter The Baddies

Enter the spiders — big, black and mean — but not too difficult to dispatch into instant oblivion. When you kill them, the entry wound is red and gory — if they get you instead, you'll lose about two pints of very red blood in the process. (Perhaps that's why you only get three lives, after that you'll have bled to death!) Having relegated a few spiders to that great web in the sky, the bowman goes into fits of delight accompanied by a crescendo of the quite excellent music. You *can* turn it off, but for once it's so good you probably won't want to.

A bee pops in next — aggressive and very fast moving, but for some strange reason, bees don't bleed when you pierce them with an arrow — they explode! Success may be yours, but there's no time to relax, for now the screen is overrun with gigantic frogs that come bouncing over the screen by the dozen, determined to squeeze the life out of our accident-prone archer. They're easy enough to hit but you've got to do some deft dodging to avoid the big squash.

Then comes the Demogorgon's pet dragon, a tricky little fellow that kills with fire. The dragon is difficult to catch as it steams in from the side of the screen and it's easy to end up as guest at the barbeque (the writhings of the bowman as he burns *are* just a touch gruesome). On the other hand, if you do manage to land a lucky shot to the head of our fiery friend then the death throes make it well worth the effort.

Survive that and all you've done is get to the next level where a ghost floats around the back of the screen controlling an army of spear-wielding skeletons that come at you from all sides. You can bump off skeletons till the cows come home but the only way to get through this level is to lodge an arrow squarely in the hooded face of the ghost. Which brings you face to face with an enormous green snake that spits venom. Don't worry — compared to the dragon, this snake's a real pussycat!

The Big One

And so to the final level — and confrontation with the Demogorgon itself. The clash always takes place at night by the light from short flashes of lightning — and aiming at a moving target illuminated for one flash every few seconds is not easy. And now, I guess it's time for me to own up . . . only on the one occasion did I manage to hit it right between the eyes, and I've no idea how I managed that stupendous feat.

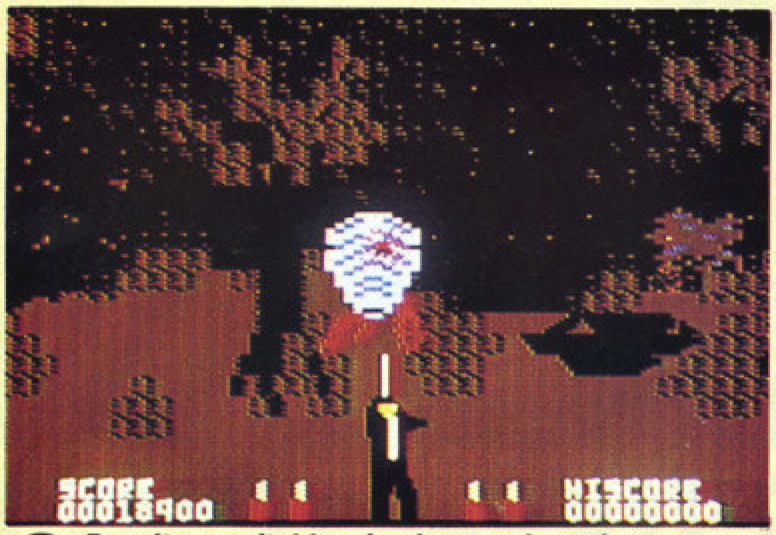
Overall, *Forbidden Forest's* combination of real 3D scenery and fast moving action are just what you'd expect from a more advanced US originated, disk-based game. The only surprising thing is that a game that would be sold at £29.95 is being sold at the recommended price of £12.95 . . . which can't be bad! G4



2 Unlike the spiders which bleed to death (see 1) the bee explodes. An accurately aimed arrow is sufficient to seal its doom, but with the frogs to follow, that's not necessarily such good news.



3 Our hero meets a squelchy end under one of the raining frogs — not a very good showing as things can get a good deal busier on this level. It's rare to see gaps between the frogs.



6 Despite a veritable rain of venom from the demogorgon's favourite — a cobra-like snake — this is not a difficult level. And here's the proof as our slippery adversary goes down for the last time with an arrow in his neck.



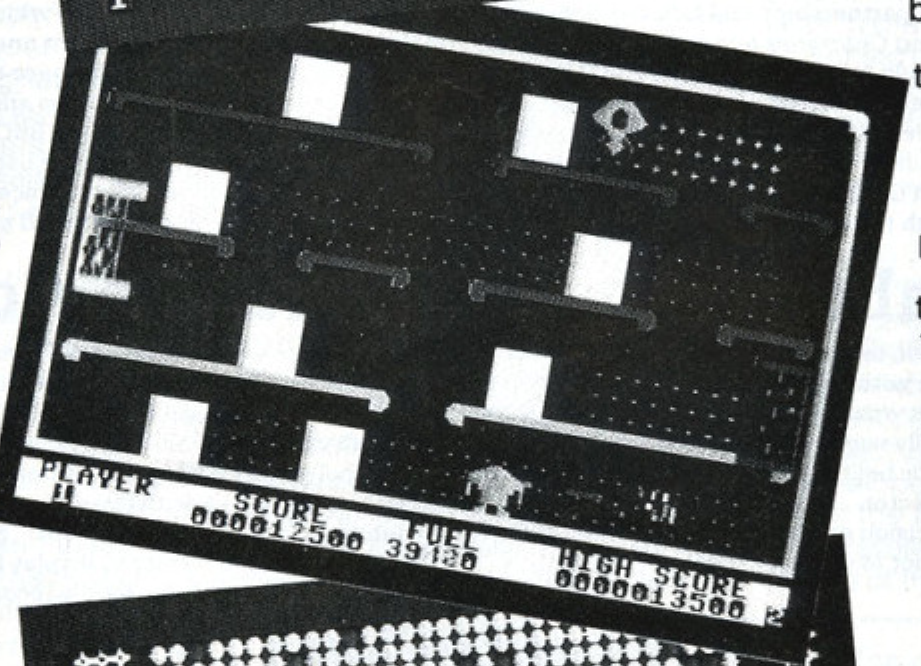
7 After all that effort and despite the many well-placed arrows, this is the end. Having failed to hit the demogorgon square between the eyes (hardly surprising with only lightning to see by) the arch baddy moves in for the kill.

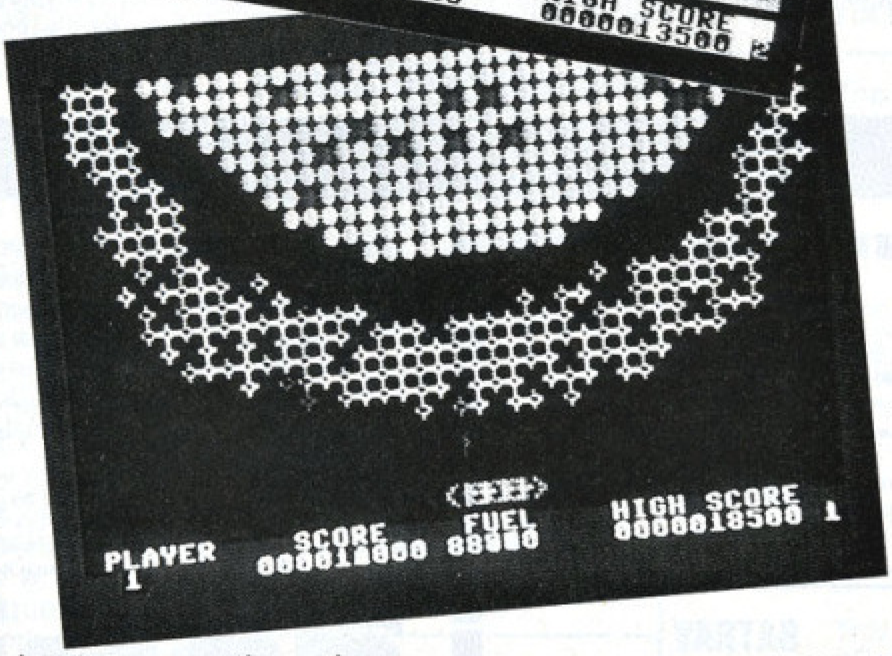


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MOTHERSHIP MADNESS!







PRIZE IDIOCY

First things first and the amazing news is that Artic Computing is promising — hand on chequebook — to stump up the first prize of a fortnight's holiday for two in sun-drenched (it says in the brochure) Florida. Well, maybe it was a full moon when they gagged their bank manager and made the announcement — still, tough Lymeswold we say.

And to compound this suppurous swelling of generosity, CBM itself has felt moved to dig deep into its corporate coffers, to present each of the five runners-up with one of its 1541 disk drive units. There — that didn't hurt at all, did it?

THE STORY SO FAR

Well, that's the best bit over — time now for the mundane details. Actually as any 64 owner who's already played Artic's *Mothership* will vouch, there's nothing mundane about the game. In face it's a real trainspotter's turn-on. Level 1 gives you a healthy dose of trench warfare as your little ship battles against enemy fighters on its way along a metallic canyon — *Star Wars* style. Level 2 has you locked in a vertical maze and attacked by such nasties as robots and flying scanners. And lastly, on Level 3 it's time to shoot your way through a shield of energy pods and destroy the Mothership.

A MOTHER OF A CONTEST

So what do you have to do to be on that 747 to Florida? Well, Artic reckons that destroying the Mothership doesn't necessarily spell the end of *Mothership* the program; in fact the company's very keen on putting together *Mothership 2*.

And that's where all you *Y64* readers come in, because the competition will be to conceive and code *the next level*. All entries written in Basic will be perfectly acceptable. As much as anything it'll be the ideas that count. So — hint, hint — remember that you're following on an existing game, not creating something completely new.

Those melliferous people at Artic will be sole judges of the entries and there is a very real chance that the winning ideas will actually end up as part of *Mothership 2* . . . in which case royalites *will* be offered!

MOTHERSHIP HOTLINE

It's just conceivable of course that not everyone reading about this fab competition has yet laid eyes on *Mothership 1*. Certainly it won't be the easiest thing in the world to design Level 4 when you've still to be stunned by Levels 1 to 3! Apart from the obvious solution of hoofing it down to your nearest stockist, Artic is offering a credit card hotline for the duration of this competition. Just ring 'em on 0401 43550 giving your plastic details and Artic will send you a copy for £5.95.

BLAH, BLAH, BLAH

The last day for entries to reach us will be 31 August 1984. And (to repeat) send them in on cassette please, along with details of your name, age and address. All entries should be mailed to: *Mothership Competition, Your 64, 14 Rathbone Place, London W1P 1DE.*

SCRATCHPAD

Welcome to 'Scratchpad', Your 64's own workshop for projects, ideas, hints, tips and advice — of whatever colour, flavour or kind. This issue's input comes from Phil Cornes, Norman Burton and Mike Turner. *Readers with contributions of their own to submit are very much invited to mail them to:*
Scratchpad, Your 64, 14 Rathbone Place, London W1P 1DE.

RESET ON THE COMMODORE 64.

As You Were!

Hitting RUN/STOP and RESTORE will sometimes break you out of a 64 lock-up . . . on the other hand sometimes it doesn't. Y64 offers an easy way of building-in RESET — all you need is a switch and 6-inches of wire.

Picture the scene . . . you've spent most of the evening typing in your latest effort, you RUN it, and nothing happens. The screen is blank and the keyboard lies dead beneath your fingers. "What the *!%$!," you ask of yourself in that quiet reserved manner "am I going to do now?".

But you know. You reach out, press the RESET button at the rear of the Commodore 64, wait for a couple of seconds, type SYS 50000 and then LIST your program. You spot the duff line immediately, correct it and now your program RUNs perfectly.

If all this sounds a little too good to be true, that's because it is — and in fact there's nothing in this article that'll help you spot a duff line that quickly. The rest, however, will now all be revealed.

Starting Over

Firstly, let's consider the 6510 CPU chip, the heart of the Commodore 64. One of its 40 pins is the RESET pin, and when this is earthed momentarily, the 6510 stops whatever it was doing and starts again at the address it finds at FFFE Hex and FFFF Hex. In the Commodre 64 this will result in the Basic initialising itself. It does so by storing the same address, OBO1 Hex, as both the start and finish of the program text area. This is obviously not so when a program is being RUN (see Figure 1).

The program text starting address is usually 0801 Hex, but if you've moved this for any reason, then you must repeat that operation now. When a program is entered, STREND, ARYTAB and VARTAB are all the same since it's only when the program is RUN that variables, arrays and strings are given values which need to be stored.

Assuming that the program crashed 'gracefully' and did not obliterate its own text, then the only part of the text altered by the RESET is the first two bytes, which are set to zeros. If we can find what they were and replace the zeros, and somehow find the end of the program text and store that in STREND, ARYTAB and VARTAB, then the program should emerge intact.

In fact, we need not do all this since we can get the Commodore 64 to help us. To understand how we accomplish this, let's see first what a Basic program looks like in memory (Figure 2). The end of the program is signified by three zeros — one for the end of the last line and two more where the next link pointer would be if there was one.

Now we can see that when the Basic initialises OBO1 Hex and OBO2 Hex to zero there are already three zeros at the beginning of the program text area and the Commodore 64 believes there is no program there. All we have to do is change either of those two zeros to a non-zero value and call a routine which starts at A533 Hex in the Basic interpreter. This routine will 're-link' all the lines in the program text area from the beginning until it finds three successive zeros. Furthermore it discovers the address of the end of the program, and stores it in 22 Hex and 23 Hex. Lastly, we copy the address from 22 Hex and 23 Hex into the locations where STREND, ARYTAB and VARTAB are stored. The program is now recovered and will LIST and RUN.

The 'Old Routine' listing gives a Basic program which locates a machine code routine for doing all this, at C350 Hex. In decimal this is 5000 — an easy number to remember. It's also in free RAM space above the Basic interpreter ROM and is therefore safe from NEW and the effects of the RESET button. Type this

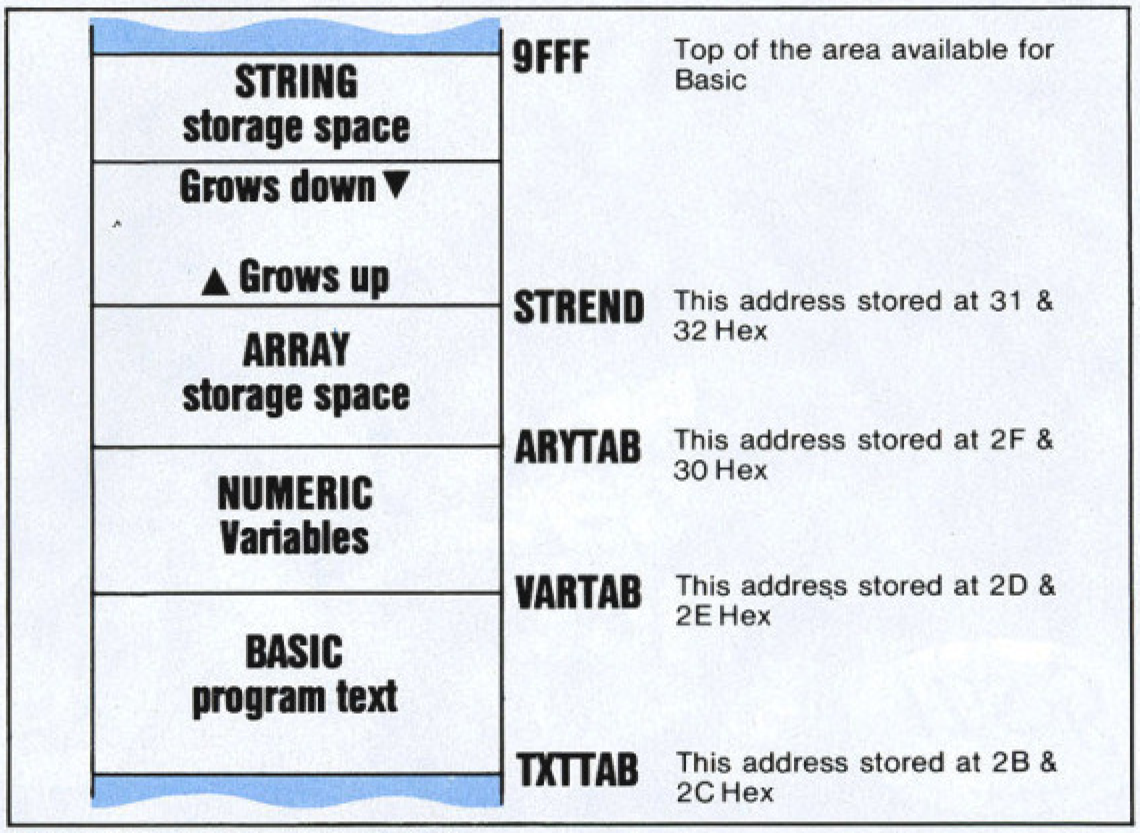
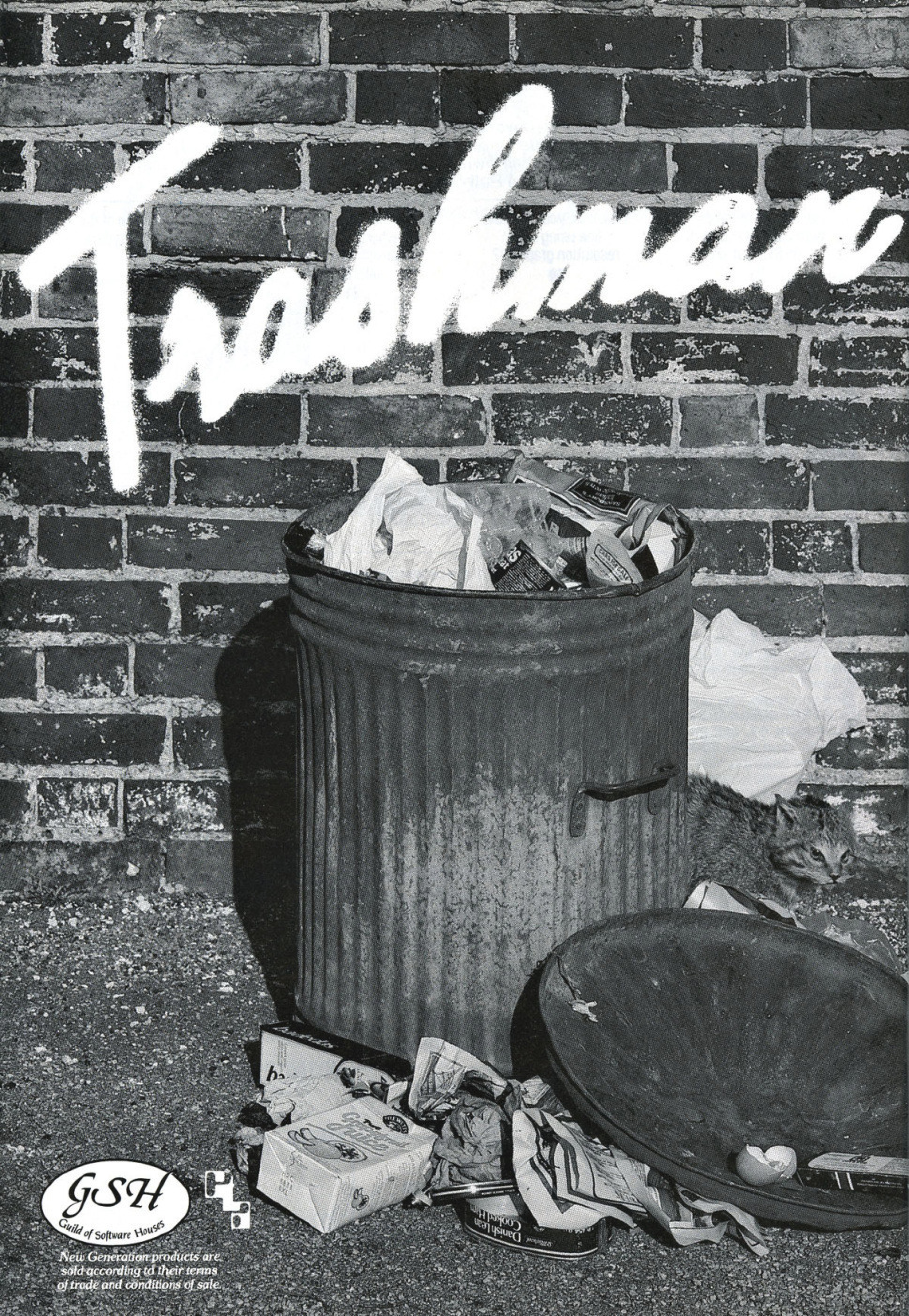
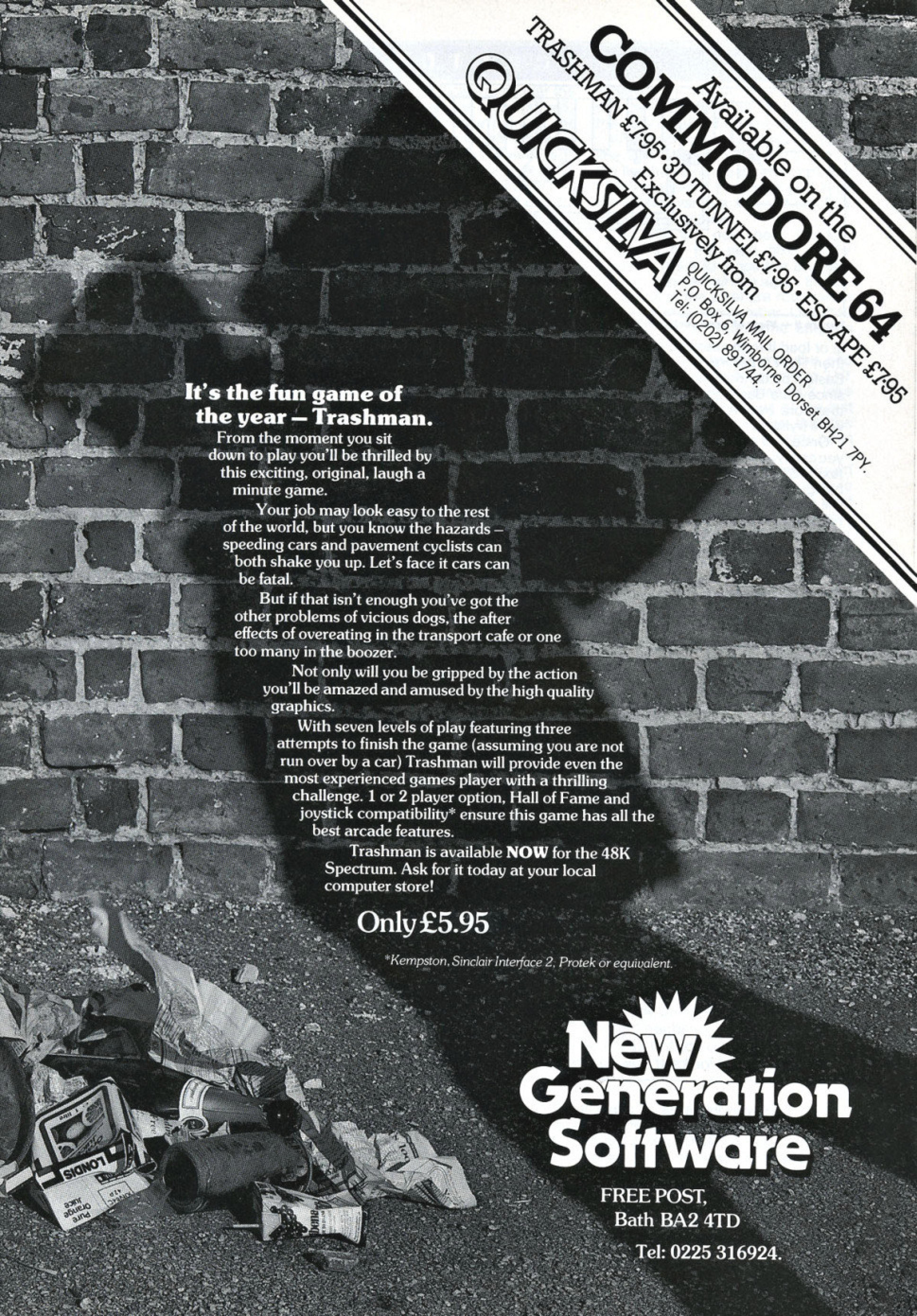


Figure 1. The Basic program area in detail


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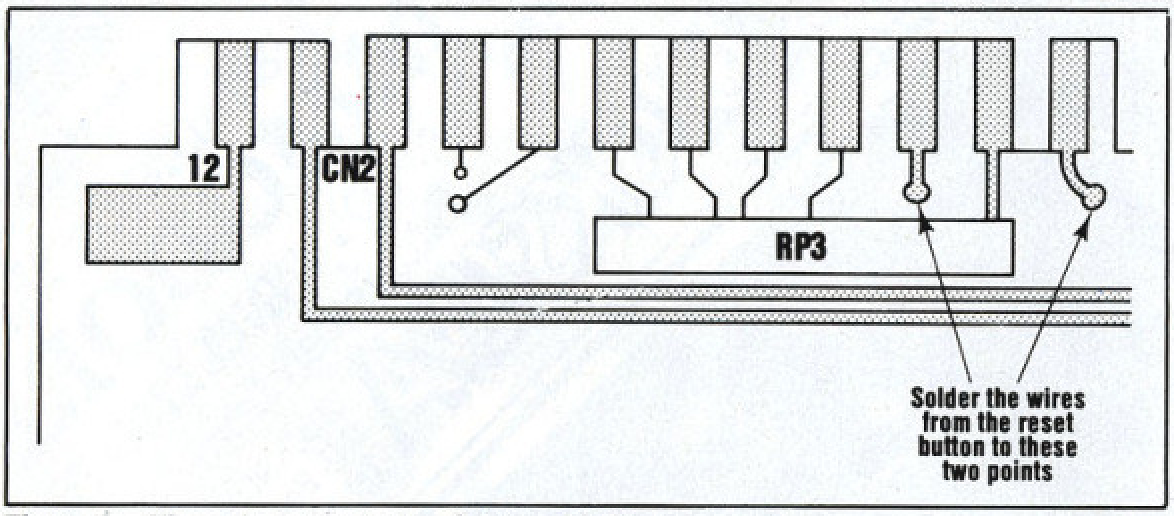


Figure 2 — View of user port showing reset button connections

in or load it from cassette or disk and then RUN it *before* you start work in Basic. You cannot load it after a crash since it's a Basic program and would therefore overwrite the program you were trying to recover!

Once you have RUN this program, you can type NEW to remove the Basic text. LIST it to convince yourself it really has gone. Now type SYS 50000. LIST will reveal the original program, recovered intact. You now have a routine which will recover a program from an accidentally typed NEW.

On The Button

So... what about this RESET button at the rear of the Commodore 64? A push-to-make button switch (20p-30p from your High Street electronics shop) and six inches of two-core multistrand wire are the only components required and fitting it could scarcely be easier.

Unscrew the three screws underneath the front of the computer and lift the keyboard half up from the front. (Warning! — this theoretically has a dire effect on your guarantee.) Prop it up against something so as not to strain the wires connecting the keyboard to the printed circuit board. Assuming you have the computer base facing you in the normal way, look in the rear left-hand corner for the user port.

Drill a suitable size hole in the keyboard half of the case in the general vicinity of the user port, and locate and secure the reset button. Solder two wires, four to six inches in length, to the tags on the button and then solder the other ends to the points shown on Figure 3; it doesn't matter which way round these are connected. Close the case and secure it with the screws.

```
10 FOR C=0 TO 25
20 READ BYTE
30 POKE 50000+C,BYTE
40 NEXT C
50 DATA 169,8,160,1,145,43
60 DATA 32,51,165,165,34
70 DATA 133,45,133,47,133
80 DATA 49,165,35,133,46
90 DATA 133,48,133,50,96
```

The Old Routine Listing

You now have a RESET button, since those two contacts on the user port are in fact earth and the RESET line from the 6510. Pushing the button at any time during the execution of a Basic program will cause the screen to contract slightly, and after two or three the Commodore sign-on message is displayed. Now type SYS 50000 and the Basic program will be recovered.

To summarise: the important points are that you load and run the Basic program *before* carrying out any work in Basic, and the RESET button and SYS 50000 will only work if the Basic text has not been corrupted in the crash.

PIXEL CONTROL IN HIGH-RES MODE

Drawing The Line

When you first switch on your 64, the screen format is 25 lines of 40 characters. To produce high-resolution graphics, however, you need to be able to control all the 64,000 pixels in the screen individually. Y64 *looks at how you negotiate the high-res road.*

The image viewing area is actually 320 pixels wide and 200 pixels deep, giving a total of 64,000 pixels for the whole screen. To have pixel control over all this you need 8000 bytes of RAM (1 bit for each pixel). The best place to locate the graphics screen in memory, is starting at location 8192.

A program that locates the graphics screen at this address and then clears the screen is given in Listing 1. But before you enter and run the program you must move Basic out of the way, by typing in the following commands directly at the keyboard:
POKE 642,64: POKE 44,64: POKE 16384,0: NEW
All of the programs given here on in assume that, using this method, you have relocated the area normally reserved for Basic.

The two sections that follow, both use the graphics screen and show you how to plot points and draw lines. The routines are both written in Basic to make it easier to see how they work. Unfortunately this is pretty slow, but those of you familiar with machine code should have no problem in writing faster versions.

The Plot Thickens

You now have 64,000 bits in memory to control the 64,000 pixels on the screen. To plot a single point on the screen (illuminate an individual pixel) all you need to know is which of the 64,000 bits in memory controls that pixel. "Hold on", we hear you say, "this all sounds a bit too easy". Certainly it would have been a nice touch if Commodore had given the two things a more simple relationship.

The easiest way of referring to the position of an individual pixel on the screen is to use co-ordinates. If you number the pixel columns from 0 to 319 and the rows from 0 to 199, any pixel can be identified by just two numbers. The column number is normally referred to as the X co-ordinate and the row number as the Y co-ordinate. The conventional way of referring to a position using co-ordinates is X,Y. Therefore, the pixel in the top left-hand corner of the screen is at postion 0,0, and the pixel in the bottom right-hand corner of the screen is at position 319,199. All you need now is a way of using the co-ordinates to find the byte in memory that controls the pixel at that position. The program in listing 2 includes a routine that will do this for you.

Lines 10 to 60 locate and clear the graphics screen. Line 70 defines the X and Y co-ordinates of the pixel to be plotted and the subroutine called from line 80 actually plots the pixel. The program is now waiting, at line 90, for you to press a key. If you look carefully, you'll see that a pixel near the centre of the screen (position 160,100) is illuminated. Pressing any key allows the program to fall through to line 100 which in turn calls a subroutine to unplot (turn off) the same pixel. Take a further look at the screen and confirm that the pixel is no longer illuminated. The program is now at line 110 and again waiting for you to press a key. Pressing any key will cause the program to fall through to the next line, where it's directed to go back to line 80. This will result in the pixel being plotted again. You are now in a loop and each time you press a key, you will either turn the pixel on or off. To break out of the program, you'll have to press the STOP and RESTORE keys simultaneously.

It's worth mentioning, by the way, that both the plot and unplot routines call a common subroutine that starts at line 190. This routine calculates the memory location of the byte that controls the pixel.

Before you leave this section on plotting points, try changing the co-ordinates in line 70 — go on, convince yourself that you can control any pixel on the screen.

Lining-Up Points

Once you've mastered the art of plotting pixels, drawing lines is not particularly difficult. If you think about

```
10 POKE 53272,PEEK(53272) OR 8
20 POKE 53265,PEEK(53265) OR 32
30 FOR C=8192 TO 16191
40 POKE C,0 : NEXT C
50 FOR C=1024 TO 2023
60 POKE C,16 : NEXT C
```

Listing 1 — Locating the high resolution screen

```
10 POKE 53272,PEEK(53272) OR 6
20 POKE 53265,PEEK(53265) OR 32
30 FOR C=8192 TO 16191
40 POKE C,0 : NEXT C
50 FOR C=1024 TO 2023
60 POKE C,22 : NEXT C
70 X=160 : Y=100
80 GOSUB 130
90 GET A$ : IF A$="" THEN 90
100 GOSUB 160
110 GET A$ : IF A$="" THEN 110
120 GOTO 80
130 GOSUB 190
140 POKE B,PEEK(B) OR M
150 RETURN
160 GOSUB 190
170 POKE B,PEEK(B) AND (255-M)
180 RETURN
190 B=8192+INT(Y/8)*320+INT(X/8)
    *8+(Y AND 7)
200 M=2^(7-(X AND 7)
210 RETURN
```

Listing 2 — Plotting a point

```
10 POKE 53272,PEEK(53272) OR 6
20 POKE 53265,PEEK(53265) OR 32
30 FOR C=8192 TO 16191
40 POKE C,0 : NEXT C
50 FOR C=1024 TO 2023
60 POKE C,1 : NEXT C
70 CX=INT(RND(0)*320)
80 CY=INT(RND(0)*200)
90 NX=INT(RND(0)*320)
100 NY=INT(RND(0)*200)
110 GOSUB 130
120 GOTO 90
130 DX=ABS(NX-CX)
140 DY=ABS(NY-CY)
150 SX=SGN(NX-CX)
160 SY=SGN(NY-CY)
170 IF DX>DY THEN XS=SX : YS=SY*DY/DX
180 IF DX<=DY THEN YS=SY : XS=SX*DX/DY
190 X=INT(CX+0.5) : Y=INT(CY+0.5)
200 GOSUB 240
210 IF X=NX AND Y=NY THEN CX=X :
    CY=Y : RETURN
220 CX=CX+XS : CY=CY+YS
230 GOTO 190
240 B=8192+INT(Y/8)*320+INT(X/8)
    *8+(Y AND 7)
250 M=2^(7-(X AND 7))
260 POKE B,PEEK(B) OR M
270 RETURN
```

Listing 3 — Drawing a line

it, a line can be produced by simply plotting a series of adjacent pixels. You do, of course, have to take into account the slope of the line (if any) and its direction. But both of these can be calculated from the co-ordinates of the two end points.

The program given is Listing 3 includes a line-drawing routine. It starts by drawing a line between two points chosen at random, and then continues to draw lines until you decide to stop it. Each new line starts from the point where the previous one terminated and finishes at a point chosen at random by the program.

Lines 10 to 60 locate and clear the graphics screen — as already described. The starting point of the first line to be drawn is defined by the co-ordinates CX (Current X value) and CY (Current Y value). The values of CX and CY are chosen at random and assigned in program lines 70 and 80. The end point of each line is defined by the co-ordinates NX (New X value) and NY (New Y value). The values of these co-ordinates are also chosen at random and assigned in program lines 90 and 100. Line 110 calls the line-drawing subroutine. Lines 130 and 180 of the program sort out the slope and direction of the line by using the co-ordinates of the two end points.

In this program, the slope of the line is defined as the number of pixels you have to move in one co-ordinate direction for every pixel you move in the other co-ordinate direction. The number of pixels you have to move horizontally is known as the X Step (XS) and the number of pixels that you have to move vertically as the Y Step (YS). The XS and YS values are calculated in lines 170 and 180.

The next step is to start plotting the line, pixel by pixel. Because pixels can only have integer co-ordinates, the X and Y co-ordinates of the pixel to be plotted have to be rounded off to the nearest whole number. This is achieved by line 90 of the program and the subroutine that actually plots the pixel is called from line 100.

After each pixel has been plotted, line 210 checks to see if the end of the line has been reached. If not, line 220 increments the value of CX by the XS step value, and the value of CY by the YS step value.

CX and CY now hold the co-ordinates of the next pixel to be plotted. Line 230 loops the program back to line 190 where again the co-ordinates of the pixel are rounded to the nearest whole number. Line 240 calls the PLOT subroutine and the pixel is plotted.

This loop continues until the end point is detected by program line 210. When this happens, CX and CY take on the co-ordinate values of the last pixel plotted. This ensures that the next line will start from the same point at which this one finishes.

The first line has now been drawn and line 210 returns the program to line 90. The co-ordinate for the next line end point are chosen at random and are again assigned to NX and NY by line 90 and 100. Line 110 calls the line drawing routine and the line is drawn as before.

The program will continue to draw lines in this way until you decide to stop it by pressing the STOP and RESTORE keys at the same time.

BUILD YOUR OWN CENTRONICS PRINTER INTERFACE

From Port To Port

Y64 explains in detail the whys and wherefores of building a parallel interface for the Commodore 64.

A number of commercially available programs for the Commodore 64 contain routines to drive a Centronics printer. Two examples are the excellent *Mikro Assembler* and *Monitor* from SuperSoft and the *Easy Script* Word Processor which comes free with the Commodore 1541 disk drive. The Commodore 64 does not, however, have a true Centronics interface, although it is possible to derive all the necessary signals and data from the user port. First of all, though, let's examine the Centronics interface in some detail.

There are basically two methods of transmitting data from a computer to a printer, or indeed any other peripheral. Either the data is sent one bit at a time down a single data line, or it's sent one byte at a time down eight data lines simultaneously, each bit having its own line. The first method is serial transmission, for which the most common standard interface is the RS232. The second is parallel transmission and here the most common interface is the Centronics.

A Centronics interface is inherently faster than its serial equivalent. This

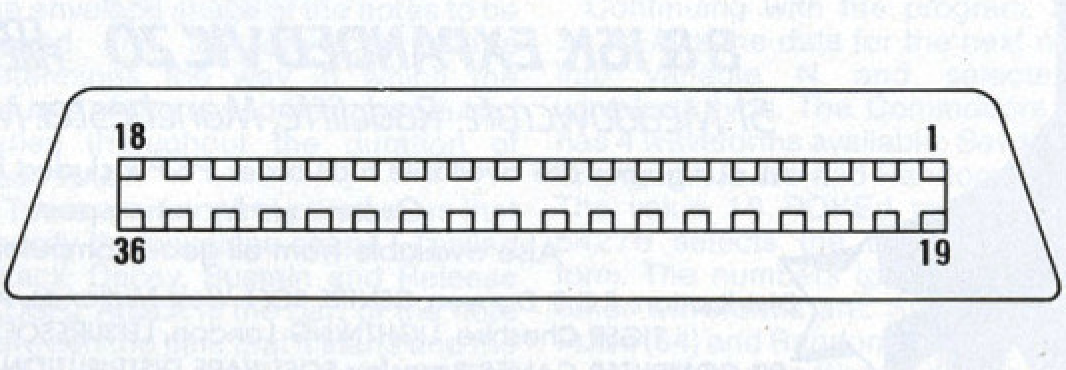


Figure 1 — View of AMPHENOL 57-30360 PLUG showing pin numbering scheme as it appears at rear of printer.

will be of great help if your printer has a reasonable size buffer since the computer will fill the buffer quickly and be free to continue processing while the printer carries on printing. The Centronics interface comprises 36 wires, some of which are unused and only 11 of which are relevant here; the rest are used for transmitting data over long distances. At the present moment we're not expecting you to have your printer more than a few metres away from the computer. The 36 lines are connected to Amphenol plugs, with the pins numbered as in Figure 1.

Pin 1 is the STROBE line. This is a strobe pulse signal for reading in the data and normally it's held high (+5v); when it does go low (0v) the data is read. Pins 2 to 9 are the eight data lines, pin 2 being for D0 (the least significant bit) and pin 9 for D7 (the most significant bit). Pin 10 is the ACK (for acknowledge) line. This is also a pulse signal, of approximately 5ms duration. Like STROBE it's active low; in other words normally at 5v, but pulsed to 0v when the data has been received. No more data may be accepted until the pulse is completed.

The last pin we're interested in is pin 16, the Signal Ground. Connect a length of ribbon cable to these eleven pins inside an Amphenol plug and there you have the printer end of the cable completed. Figure 1 shows the numbering scheme of the user port connector.

The connections you need to make are all on the underside of the user port connector, and are the lettered tags shown in Figure 2 (we've used the same numbering scheme as in the Commodore 64 *Programmers Reference Guide*. Note that the letters G and I are not used. Figure 3 shows the actual connections to be made between printer and Commodore 64.

PRINTER			COM64
STROBE	1	M	PA2
D0	2	C	PB0
D1	3	D	PB1
D2	4	E	PB2
D3	5	F	PB3
D4	6	H	PB4
D5	7	J	PB5
D6	8	K	PB6
D7	9	L	PB7
ACK	10	B	FLAG 2
GND	16	A or N	GND

Figure 3 — Connections between printer and Commodore 64 showing pin numbers and names

The data you send to the printer comes to the user port from Port B on the second of the two 6526 CIA chips. Eight data lines on Port B are used together with Flag 2 and bit 2 on Port A. These last two perform the operations described under STROBE and ACK which are generally referred to as 'handshaking'. The Commodore 64 end of the ribbon cable needs to be soldered on to the correct tags of a 24-way edge connector socket. This can then be pushed on to the user port connector and your Centronics interface is complete.

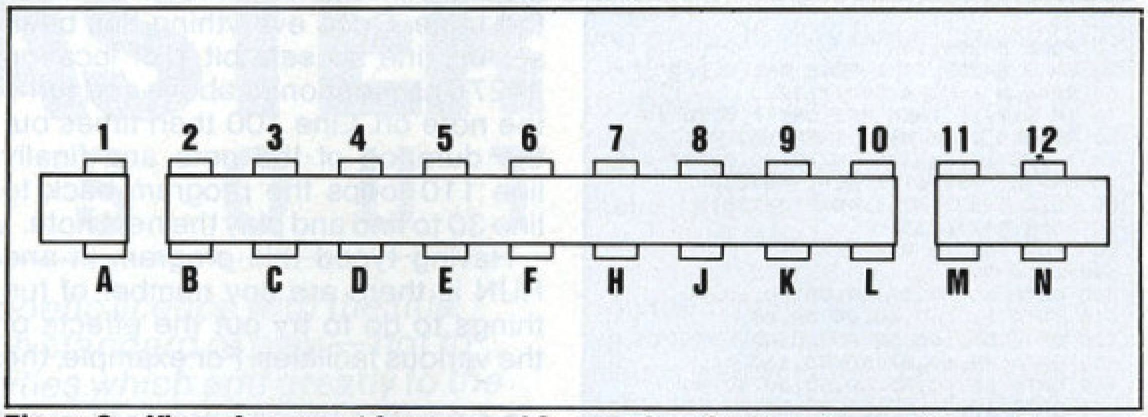


Figure 2 — View of user port from rear of Commodore 64. Note the positions of the keyways

POKEING FUN AT MUSIC

Shaping-Up Sounds

The Commodore 64 has one of the most powerful sound synthesiser facilities available on any home micro and, just as with graphics, these are accessed by use of the POKE statement. Here's how you 'tinkle the bytes'.

The sound on the Commodore 64 is all controlled by a single integrated circuit chip called the Sound Interface Device (SID for short). Inside SID there are 29 internal registers to control all the functions associated with the three sound channels. These appear as 29 memory locations in the Commodore 64 memory map, starting at location 54272 and extending to location 54300.

The program listing for '*The Tune Machine*' shows how to create a simple tune machine that can READ note information from a set of DATA statements and play the tune specified. Don't forget when you RUN this program that the Commodore 64 plays all its sounds over the TV loudspeaker, so you'll need to twiddle the volume on your TV set or you'll hear nothing. Here's how the program works:

Line 10 adjusts the SID chip master volume control to full by POKEing the value 15 into memory location 54296. There are 16 volume settings available to be POKEd here, from off (00) to maximum (15). Line 20 sets up the envelope shape of the notes to be played and the envelope shape determines the way in which the volume of the sound being produced varies throughout the duration of each note.

There are 4 control parameters that specify the envelope shape — called Attack, Decay, Sustain and Release (ADSR). Attack is the part of the note between the time that it starts and the time it rises to maximum volume. The duration of the Attack is controlled by the high order 4 bits of location 54277, from 2mS with a value of 0, to 8 seconds with a value of 15. Decay is that part of the note between the end of the Attack period and the point where the volume stops decreasing (in other words, where the main body of the note starts). The Decay time is controlled by the low order 4 bits of location 54277 and varies from 6mS with a value of 0, to 24 seconds with a value of 15.

Sustain is the volume level of the main body of the note and it's specified as a proportion of the maximum volume at the end of the Attack. Sustain is controlled by the high order 4 bits of location 54278, where a value of 0 indicates that the note decays to 0 volume and 15 indicates that the note does not decay from maximum at all. Finally, the fourth parameter is the Release rate — the length of time it takes for the sound to die away to zero from the Sustain level when the note is turned off. Release rate is controlled by the low order 4 bits of location 54278. A value of 0 gives a release of 6mS and this increases to 24 seconds with a value of 15.

Continuing with the program, line 30 READs the data for the next note into variable N and selects a waveform type. The Commodore 64 has 4 waveforms available: Sawtooth, Triangular, Pulse and Random Noise. The value 16 POKEd into location 54276 selects the triangular wave form. The numbers to POKE for the other waveforms are: Sawtooth (32), Pulse (64) and Random Noise (128).

As well as selecting the wave form this location also switches the note on or off. This is controlled by bit 0 in

```
10 POKE 54296,15
20 POKE 54277,12 : POKE 54278,165
30 READ N : POKE 54276,32
40 IF N<(-1) THEN RESTORE : GOTO 10
50 READ D : IF N=-1 THEN 100
60 Z=INT(16.3516*2^(N/12)/0.06097+0.5)
70 NH=INT(Z/256) : NL=Z-NH*256
80 POKE 54272,NL : POKE 54273,NH
90 POKE 54276,33
100 FOR T=1 TO D : NEXT T
110 GOTO 30
400 DATA 55,80,57,60,58,60,60,60
410 DATA 62,160,60,60,58,60
420 DATA 57,160,58,60,60,60
430 DATA 58,60,57,60,55,160
440 DATA 63,60,62,60,62,60,60,60
450 DATA 60,60,58,60,58,60,57,60
460 DATA 57,60,55,60,55,60,57,60
470 DATA 55,60,54,60,52,60,50,60
480 DATA 55,60,57,60,58,60,60,60
490 DATA 62,160,60,60,58,60
500 DATA 57,160,58,60,60,60
510 DATA 58,60,57,60,55,160
520 DATA 63,60,62,60,62,60,60,60
530 DATA 60,60,58,60,58,60,60,60
540 DATA 57,300,55,120,55,800
550 DATA -1,1000,-2
```

The Tune Machine

the byte (1 to turn the note on and 0 to turn it off). Line 40 starts the program up again when a value is read from the data that's less than −1. Line 50 reads the duration of the note to be played. A note value (N) of −1 indicates a quiet rest for the specified duration.

Lines 60 to 80 take the note value read into variable N and convert it to the 16-bit value needed to generate the required note. A table of values of N and the notes generated is given in the table. Once everything has been set up, line 90 sets bit 1 of location 54276 as mentioned above and turns the note on. Line 100 then times out the duration of the note and finally line 110 loops the program back to line 30 to find and play the next note.

Having typed this program in and RUN it, there are any number of fun things to do to try out the effects of the various facilities. For example, the values POKEd in line 20 can be altered to give a different envelope shape, or the values POKEd in lines 30 and 90 can be changed to use a different waveform. The program can even be expanded to play notes simultaneously on all three sound channels available in the SID chip, instead of just using channel 1 as we have here. 6 4

Octave Note		0	1	2	3	4	5	6	7
	C	0	12	24	36	48	60	72	84
C#	Db	1	13	25	37	49	61	73	85
	D	2	14	26	38	50	62	74	86
D#	Eb	3	15	27	39	51	63	75	87
	E	4	16	28	40	52	64	76	88
	F	5	17	29	41	53	65	77	89
F#	Gb	6	18	30	42	54	66	78	90
	G	7	19	31	43	55	67	79	91
G#	Ab	8	20	32	44	56	68	80	92
	A	9	21	33	45	57	69	81	93
A#	Bb	10	22	34	46	58	70	82	94
	B	11	23	35	47	59	71	83	95

The DATA values for each note

THE MASTER CHECKSOUT

Even taking a large pinch of poetic licence with the title, Grandmaster *does offer a high standard of play — not to mention a number of extra facilities which add greatly to the enjoyment of using it. It's available for both the VIC 20 and* Commodore 64. Bob Chappell *reports . . .*

The big attraction of chess programs is that you can have a game whenever you feel like it. You can play for as long as you want and at whatever standard of skill you wish. *Grandmaster* itself can be used as a chess tutor, as a challenging opponent, or for experimentation and analysis. And in addition you can ask for help, force it to make an instantaneous decision, or let it play against itself — you can even cheat with impunity, if you want!

The program comes on a cassette tape, attractively boxed together with an instruction manual. You load it as usual via the Commodore tape deck, and execute with the RUN command; no joystick or other fiddly bits are necessary.

The first thing you see is a black and white chessboard plus pieces, surrounded by a green border. To the right of the board is an area reserved for displaying the program's logo, two chess clocks, plus a space for moves and messages. The chess pieces are traditionally styled, recognisable, and pleasing to the eye. The one exception here is the design of the King. Depending on the colour of the background, it sometimes seems to resemble a pair of miniaturised buttocks! Of course this may just be a product of my warped imagination.

The border, background and foreground colours are changed at the mere tap of a function key. Hitting F3 for instance causes the background to rotate through each of eight foreground colours. Similarly the F5 key provides 16 background colours and the F7, key eight border colours. Those of mathematical bent will realise that in theory there are therefore 1024 possible colour combinations. In practice, a good number of these will be unviewable. Nevertheless there are enough suitable blends to satisfy most people's tastes for coloured chessboards and pieces. And whenever you tire of one combination, you can change it as many times as you like during the game — but only when it's your turn to move.

Grandmaster offers 10 levels of skill, all based on setting a limit to its response time. In other words, when it's the computer's turn to play it only has a fixed amount of time to think before making its chosen move. Level 0 has a response time of days — something that's only of practical use for postal chess, intensive analysis of a position, or for those who like taking things easy! Level 1 — which is what the program automatically sets itself to before a game starts — has a response time of five seconds. In fact to begin with, the average response time is far quicker than this as *Grandmaster* is able to delve into its comprehensive book of orthodox opening moves. This enables it to select virtually instantaneously, as long as it's still within the limits of its knowledge of opening moves. In fact the book seems to encompass up to the first five moves, and although I wasn't able to test its range thoroughly, the most common openings seemed to be there.

The other levels extend from 15 seconds response time to three minutes (allowing a tournament level of 40 moves in two hours) — and on up to two hours. The manual describes this latter level as being for 'the very patient player'! Setting the level is easy — typing L and the level number (0-9) causes the new level to operate. Again you can do this at any time during the game, provided it's your turn.

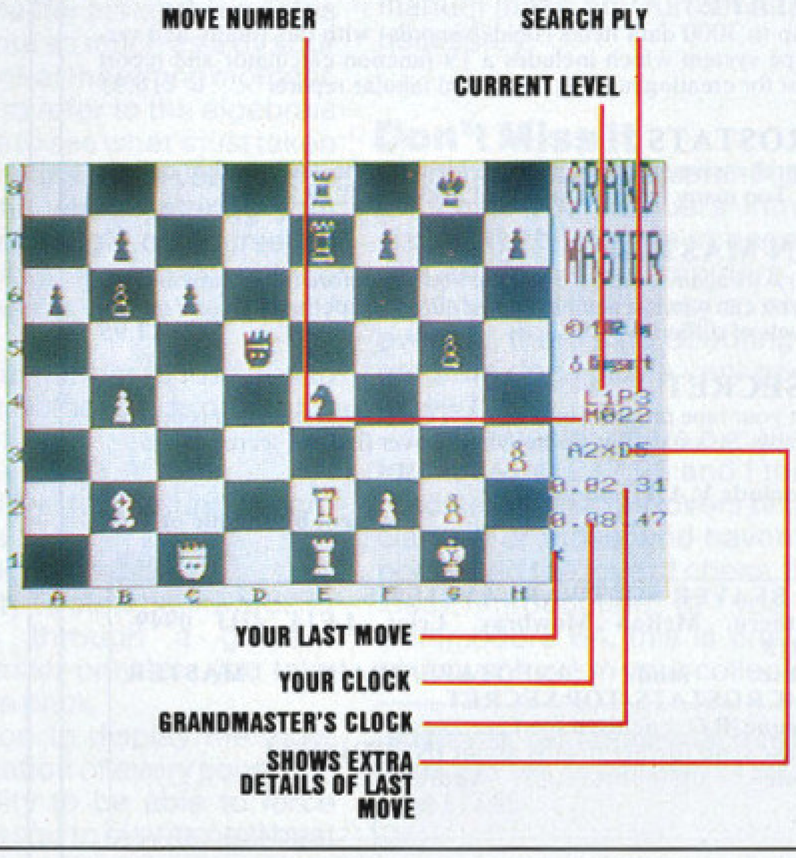
At the start of the game, the white pieces are at the bottom of the board. If you prefer to play black, pressing the Control and zero keys together causes the board to flip round. Now the black pieces are at the bottom and, as white always plays first *Grandmaster* will make its opening move from the top of the board. Hitting Control and zero during the course of a game will abandon the current situation and set you up for a new game. This time though the pieces will be at the opposite ends to before; that means you'll have to press Control and zero twice if you want to play with the same pieces again.

Normal algebraic notation is used to identify each square. The bottom and left-hand side of the board show the rank and file letters and numbers. To enter a move you type in the location of the FROM square followed by the location of the TO square — for example E2E4 will move the piece on E2 to square E4. If the move is illegal, *Grandmaster* blows a raspberry and waits for you to enter something that's allowed. You can use the Delete key to amend any incorrectly entered moves, but only before the Return key has been pressed.

Having entered a legal move, the display immediately reflects the new position. Your chess clock (a strip showing hours:minutes:seconds) is stopped and *Grandmaster*'s clock is there for information purposes only. *Grandmaster* on the other hand will always respond within the time set by the Level command. The Level selected and total number of moves made are continuously displayed.

While *Grandmaster* is calculating its move, there are four visual indications to tell you the program is still active. Firstly the chess clock continues to tick away. Secondly, two indicators at the top and bottom of the message area

GRANDMASTER'S SCREEN LAYOUT



THE MASTER CHECKSOUT

flash on and off. Thirdly, *Grandmaster* shows what point it has reached in its analysis by displaying the letter P followed by a number. For example, P3 means that it has examined:

(a) All possible replies to your last move.
b) All your possible responses to (a).
(c) Its possible responses to (b).

Fourthly, while the search is going on *Grandmaster* will display the best move it has found so far. When its time is up, the program gives an audio signal, displays its chosen move and then updates the board. If you think *Grandmaster* is taking too long, you can force it to play the best move found so far by pressing the Run/Stop key. It'll immediately take the hint and respond with its move.

Grandmaster not only selects the best move for itself — it can also be induced to recommend a good move for you. It's easy to cop out, just press the ? key and you'll see the hint. If you decide to play that move, hitting the Return key causes it to happen.

The last moves by both sides are always shown, displayed with extra annotation. For example, a normal move might be shown as E2 — E4, a capture as E4 X F5, and a check as A1 — A8+. If *Grandmaster* detects that it will mate you in two moves, it will announce the fact with a loud flourish and absolutely no shame — just the brief message (MATE IN TWO). If you manage to mate *Grandmaster*, it will accept the tragedy silently, but stoically, with the poignant message, MATE.

There's no facility for setting up a board position so I was unable to force a Stalemate to see if Grandmaster dealt with it appropriately. It had clearly been programmed to avoid a 'third repetition of the position' draw but I was unable to find out if it also coped with the '50 moves without a capture or pawn move' draw. However there seems little reason to doubt the program's ability to cope with these situations.

Castling, *en passant* and Pawn Promotion are all catered for, but one slightly unfair restriction is that although *Grandmaster* will automatically select the most appropriate piece when promoting one of its own Pawns, you are stuck with anything *you* like so long as it's a Queen. In fairness I suppose it would be quite rare to want anything other than a Queen. Nevertheless, this is one feature that conflicts with the laws of the game of chess.

There's a facility for taking back the last move made. Hit the left-pointing arrow key and the board will reflect whatever the position was before you made your last move. This can even be done in *Grandmaster's* opening book — handy if it starts to play a variation you don't like. It's also useful when you've just made an atrocious blunder and would rather pretend that it had never happened. Some might call it cheating, I prefer to call it experimentation!

Through The Hoops

I put *Grandmaster* through its paces against three other chess programs: *Microchess*, *Petchess* and Fidelity's *Sensory Chess Challenger*.

Microchess was the first chess program to appear on the Pet and, although not noted for playing a strong game, it was still a milestone in chess-playing programs. *Grandmaster* comprehensively trounced *Microchess*, even when *Microchess* was playing on its higher skill levels and *Grandmaster* on its lowest.

Petchess is a very good chess program, written by David Levy and Kevin O'Connell in 1981. It put up a rather better fight but still failed to win or draw any games against *Grandmaster*. Again, *Grandmaster's* level of play at low skill levels was significantly better than *Petchess* on its higher levels.

The *1 Sensory Chess Challenger* is a pressure sensitive chessboard that houses a ROM chess program. This particular version sells for around £120. *Chess Challenger* managed to win on game but only at a level that took four times longer than *Grandmaster*. When *Grandmaster's* level was raised just one notch (still faster than *Chess Challenger*), it won.

None of these matches was intended to be a conclusive proof of *Grandmaster's* ability. They did indicate, however, that it could not only play better chess but also play it much faster.

Downside Details

Grandmaster is not without some minor defects. Some programs update the board by flashing the FROM and TO squares before finally moving the piece; *Grandmaster* instantly updates the board wthout so much as a by your leave. If you blink at the wrong moment, you may have to refer to the algebraic move message to see what's just taken place. It also means when you have to be extra careful when entering your own moves, although of course an erroneous but legal move can easily be retrieved by means of the 'take back' facility.

It does lack a number of features to be found in some other chess programs — for instance:

(a) The facility for setting board positions.
(b) Instant 'action-replay'.
(c) The ability to step backwards or forwards through a game... *Grandmaster* only lets you take one move back.
(d) The option to display the algebraic notation of every square.
(e) The facility to be able to force *Grandmaster* to play its next best move — useful for trying out variations.
(f) Coupled with (a) above, a mode that enables the player to solve mating problems (for example White to play and mate in three moves).

Given the 64's large quota of RAM, the inclusion of these would have transformed *Grandmaster* from an excellent chess program into a superb one.

Grandmaster does have its 'idiosyncrasies'. On one occasion while using the Hint facility it recommended an illegal move! The bug wouldn't repeat and the game proceeded to a normal conclusion. A further bug — this time a constant one — was that on the first move outside of its book, the program positively refused to give any hint as to my best move. Either side of this point there was no problem.

The Restore function is disabled and it appears impossible to crash the program, accidentally or otherwise. The only way to leave *Grandmaster* is to power off and on again, which in many ways is the best form of protection against crashing.

Words Of Support

The user manual is small, clearly printed, and covers loading and running and the program's features. For good measure, it also throws in the ground rules and a potted history of chess.

The booklet is clear, concise and without omissions. The only criticisms I could find are that it explains the Knight move in a misleading manner, and doesn't adequately say what the F8 function key is all about. On this latter point, the manual says that it "selects interlace mode (required only for some TV sets)". The only effect it had on my one-eyed monster was to reset the colours to what they were at the start.

In general though, the excellence of the program and the quite satisfactory manual make any further support unnecessary.

Don't Miss It

Grandmaster plays a fast and lusty game of chess. The manual's introduction claims it's the world's strongest chess program for home computers. That kind of statement isn't easy to check; but even so, there's no doubting that the program does play a very good game indeed.

Grandmaster offers excellent value for money at £17.95 and I thoroughly recommend it to all lovers of the Royal Game. For those who haven't yet experienced the joys of chess, this is the ideal introduction. If you own a Commodore 64, this is one program you *must* have in your collection. 64

Grandmaster, from Audiogenic Ltd, is available on cassette for both the Commodore 64 and VIC 20 — price £17.95

KEYBOARD KAPERS

It's time to inject some 'play power' into your screens, courtesy of software supremo, Mark Greenshields. *We're proud to present three splendid programs for your Commodore micro — go on, treat yourself . . .*

ISLAND BLITZ

Here's an updated version of an oldie but goldie — namely *Blitz*, originally written for the Nascom in the early days of microcomputing. The game itself, although written entirely in Basic, is faithful to the original and makes good use of the 64's sound, user-defined graphics and sprite facilities.

The story so far is that you've strayed too far over enemy territory and your bomber is fast running out of fuel. Trouble is, after a long flight over the ocean you've reached an island without a friendly airfield in sight and the altimeter is all but screaming at you that you're beginning to lose height — just as you approach a huge city.

Fortunately, the city has been evacuated of its citizens so you can throw your moral qualms to the winds and set about flattening the buildings in an effort to create a makeshift airfield and save your skin. But, disaster upon disaster, there's a problem in the missile bay — although your ground crew were diligent enough to provide an almost limitless supply of bombs, you find you can only drop one at a time. And this is where the tactics come in; try and destroy the highest buildings first, otherwise you're going to find yourself in a mess.

The controls for the game are very simple — you drop a bomb using the Space Bar; you'll find that at least the automatic pilot works! Should you manage to clear the buildings in time, you will be able to land your plane successfully. You will then receive a bonus for rescuing a stranded survivor before you move on to the next level — which is similar to the first . . . just a whole lot more difficult!

Line 0 Disables the RUN/STOP and GOSUBs to the 'set-up user-defined graphics' routine at line 60.

```
0 POKE788,52:PRINTCHR$(8)CHR$(142):CLR:GOTO61
```

Lines 1-5 Set up the variables, clear the SID chip and prepare it for the task in hand.

```
1 S=0:HS=0:SC=0
2 POKE198,0:WAIT198,1
3 POKE53281,0:POKE53280,0:POKE53272,24
4 PRINT"␣"
5 A=1106:B=54296:C=54272:D=32:E=0:L=0:FORZ=CTOB:POKEZ,0:NEXT:POKEB,15:POKEC+5,12
8
```

Line 6 Sets up Voice 1 and draws the ground.

```
6 POKEC+6,128:POKEC+4,33:PRINT"␣":FORZZ=1984TO2023:POKEZZ,0:POKEZZ+C,5:NEXT
```

Lines 7-11 Draw the buildings on-screen. This routine also prints the score, the highest score so far achieved and the screen level you have reached.

```
7 DEFFNA(X)=INT(RND(1)*X):V=53248:POKEV+28,5
8 FORX=2TO38:J=FNA(3)+1:G=FNA(9)+2:I=FNA(13)+2:POKEC,200
9 FORE=0TOG:IFE<>GTHENPOKE1944+X-40*E,J:POKE56216+X-40*E,I:POKEC+1,255-23*G:GOTO
11
10 POKE1944+X-40*E,4:POKE56216+X-40*E,I
11 NEXT:I=FNA(13)+2:NEXT:PRINT"▓▓▓▓:;<=>";S;TAB(15)";?-↑:";SC;TAB(25)"!?-!:;<=>
";HS
```

Line 12 Finishes setting up the screen.

```
12 FORR=0TO39:PRINT"M";:NEXT:POKEC+4,129:POKEC,200:POKEC+1,200:POKEC+6,128:POKEC
+5,128
```

Lines 13-17 The main loop of the program, in which the plane is moved and a check is made to see if it has crashed into one of the buildings.

```
13 POKEA+L+C,2:POKEA+L-1+C,2:POKEA+L,5:POKEA+L-1,6:POKEA+L-2,D:L=L+1
14 IFPEEK(197)=60ANDA+L<1943THENGOSUB18
15 Q=PEEK(A+L):IFQ=1ORQ=2ORQ=3ORQ=4THEN34
16 IFA+L=1983THENPOKEV+41,254:POKEV+37,247:POKEV+38,240:GOTO47
17 FORR=1TO50:NEXT:GOTO13
```

PROGRAMMER PROFILE

As Mark Greenshields has pulled out all the programming stops to provide us with the necessary for this part of the magazine, we thought you might like to know more about the man behind the machine.

Mark started programming a mere two and a half years ago, and has become proficient on both the Commodore 64 and the BBC Micro. His career to date includes two books for Interface Publications: *Mastering The Commodore 64* and the soon to be released *Mastering Machine Code On Your 64.* Mark has also written a game for the software house, Screenplay, called *Mad Monty.*

His current projects include writing a third book, which is provisionally entitled *Forty Best Machine Code Routines For The 64,* and a 3D game which he describes as "a fighter game set in the Grand Canyon, but I haven't decided on a name for it yet". When asked about his future plans, he took a deep breath and said, "Oh, loads of things, I'm scheduled to write another three books this year, and I'm trying to start up a software company but, as usual, money seems to be a problem".

One thing's for sure, in amongst this busy schedule, Mark will be sharing the wealth of his machine code knowledge with readers of *Your 64* in future issues.



Lines 18-25 The 'drop bomb' routine.

```
18 POKEB,15:POKE54284,128:POKE54285,128:POKE54283,33:POKE54279,200
19 M=A+L+39:J=1:POKEM-39,D:Z=240:POKE54280,200
20 POKEM-40,D:POKE54284,128:POKEM+C,6:POKEM,7:MM=PEEK(M+40):POKE54280,Z:IFMM=0TH
ENGOTO33
21 IFMM=1ORMM=2ORMM=3ORMM=4THEN26
22 Q=PEEK(A+L):IFQ=1ORQ=2ORQ=3ORQ=4THEN34
23 M=M+40:N=A+L:POKEN+C,2:POKEN-1+C,2:POKEN,5:POKEN-1,6:POKEN-2,D:Z=Z-5
24 FORR=1TO50:NEXT:L=L+1
25 GOTO20
```

Lines 26-32 This routine checks to see if the bomb has hit a building. If it has, then six sections of the tower block are erased from the screen.

```
26 IFS>99999THENS=0:HS=0:PRINT"■■■■:;<=>";S;TAB(25)"!?-!:;<=>";HS
27 POKE54283,33:FORR=0TO2:POKE54279,150:POKE54280,150:NEXT:POKE54283,0
28 S=S+1:PRINT"■■■■:;<=>";S:IFS>HSTHENHS=S:PRINT"■■"TAB(25);"!?-!:;<=>";HS
29 Q=PEEK(A+L):IFQ=1ORQ=2ORQ=3ORQ=4THEN34
30 IFPEEK(M+40)=0THEN33
31 M=M+40:POKEM+C,6:POKEM,7:POKEM-40,D:N=A+L:POKEN+C,2:POKEN+C-1,2:POKEN,5
32 POKEN-1,6:POKEN-2,D:J=J+1:IFJ<7THENL=L+1:GOTO27
```

Line 33 Erases the bomb once it has exploded.

```
33 POKE54283,0:POKEM,D:RETURN
```

Lines 34-39 The 'explosion' routine.

```
34 POKE54283,0:POKEA+L+C,7:POKEA+L,10:GOSUB1000
35 Y=40
36 POKEA+L+Y-1+C,5:POKEA+L+Y-1,8
37 FORR=1TO200:NEXT
38 Y=Y-40:POKEA+L+Y+39,D:IFPEEK(A+L+Y-1)=13THEN42
39 GOTO36
```

Lines 42-44 Move the parachutist sprite should you crash into one of the buildings.

```
42 V=53248:POKEV+28,0:I=1000
43 POKE2042,250:POKEV+4,(A+L+Y-1025)*2:POKEV+27,0:POKEV+21,4:POKEV+41,5
44 FORSP=0TO220:POKEV+5,SP:FORR=0TO 50:NEXT:NEXT:FORR=0TO1000:NEXT:POKEV+21,0
```

Lines 45-46 The 'end of game' routine.

```
45 POKEC-I,21:SC=1:PRINT"■■■■■■YOU SCORED ";S;"POINTS":IFS>HSTHENPRINT"■■■■■BE
ST YET!":HS=S
46 PRINT"■■■■■■■■■■■PRESS A KEY TO REPLAY!":POKE198,0:WAIT198,1:S=0:POKE53272,2
4:GOTO4
```

Lines 47-49 The 'land plane' routine.

```
47 J=0
48 POKE1982,D:POKE1983,D:POKE1981,D
49 FORW=1TO20:O=A+L+W-40:POKEO+C,2:POKEO+C-1,2:POKEO,5:POKEO-1,6:POKEO-2,D:POKEC
+4,0
```

Lines 50-54 Move the survivor into the plane if you manage a successful touch-down.

```
50 FORR=0TOJ:NEXT:J=J+30:NEXT:V=53248:POKEV+21,1:CH=13:POKEV+1,221:POKEV+16,1:PO
KEV,85
51 FORP=85TO2STEP-2:POKEV,P:CH=14:POKE2040,CH:FORR=1TO50:NEXT:P=P-2:POKEV,P
52 CH=13:POKE2040,CH:FORR=1TO50:NEXT:NEXT:POKEV,255:POKEV+16,0:FORP=255TO165STEP
-2
53 POKEV,P:CH=14:POKE2040,CH:FORR=1TO50:NEXT:P=P-2:POKEV,P:CH=13:POKE2040,CH
54 FORR=1TO50:NEXT:NEXT:POKEV+21,0:XC=10:POKEC+4,129:POKEC+5,128:POKEC+6,128:POK
E54272,255
```

Lines 55-57 This routine controls the plane's take-off and calculates the bonus for completing the screen and picking up the survivor.

```
55 FORA=1925TO1030STEP-39:POKEA+C,2:POKEA+C-1,2:POKEA,5:POKEA-1,6:POKEA+38,D:POK
EC+1,XC
56 POKEA+37,D:FORR=1TO200:NEXT:POKEA,D:XC=XC+1:NEXT:RS=INT(RND(1)*100):POKE53272
,21
57 POKE54276,0
```

Lines 58-59 The 'cleared level' routine.

```
58 PRINT"■■■■■YOU SCORED"S"POINTS":PRINT"■■■PLUS A BONUS OF"RS*(SC+1):S=S+RS*(S
C+1):HS=S
59 PRINT"■■■■■■■■■■PRESS A KEY TO CONTINUE":SC=SC+1:POKE198,0:WAIT198,1:GOTO3
```

Lines 60-78 This routine creates the high resolution screen and holds the data which comprises the user-defined graphics.

```
60 REM HIRES
61 :POKE53281,1:POKE53280,10:CLR:PRINT"■■■■■■■■■■■■ISLAND BLITZ"
62 FORQ=8430TO8460:POKEQ,0:NEXT
63 FORQ=8192TO8302:READV:POKEQ,V:NEXT
64 DATA35,255,170,85,170,85,170,85,153,153,255,195,195,255,153,153
65 DATA231,231,255,165,165,255,231,231,247,147,159,247,147,159,243,243
66 DATA51,61,42,58,44,32,126,255,254,68,137,253,255,253,253,24
67 DATA1,112,120,125,255,63,31,8,126,24,60,126,126,126,60,24
68 DATA24,60,66,129,90,60,90,129,16,56,62,80,40,71,32,0,74,90,84,185,74,44,89,25
5
69 DATA8,68,150,185,124,248,240,224,8,28,252,121,62,31,15,3,0,0,255,0,0,0,0,0
70 FORQ=8576TO8735:READP:POKEQ,P:NEXT
71 DATA0,126,70,74,82,98,126,0,0,56,24,24,24,24,126,0,0,126,66,4,120,98,126,0
72 DATA0,126,2,62,6,6,126,0,0,64,64,64,96,100,126,4,0,126,64,64,126,6,126,0
73 DATA0,96,96,126,98,98,126,0,0,126,2,2,6,6,6,0,0,126,66,126,66,66,126,0
74 DATA0,126,66,66,126,6,6,0
75 DATA0,126,64,126,6,6,126,0,0,126,66,64,96,98,126,0,0,126,70,66,66,66,126,0
76 DATA0,124,68,68,120,100,100,0,0,126,64,64,126,96,126,0,0,16,16,16,24,24,24,0
77 DATA0,62,8,8,12,12,12,0,0,66,66,102,24,24,24,0,0,66,66,66,126,98,98,0
78 DATA0,126,66,64,102,100,126,0
```

Lines 80-84 Print out the instructions for the game.

```
80 POKE53272,21:GOSUB100:POKE8303,0
81 PRINT"■■■■■■■■■■■■ISLAND BLITZ":PRINT"■■THE OBJECT OF THE GAME IS TO BLOW UP
THE"
82 PRINT"BUILDINGS SO THAT YOU CAN LAND SAFELY   ■AND PICK UP YOUR PASSENGER"
83 PRINT"■■■  SPACE BAR TO DROP A BOMB":FORQW=54272TO54296:POKEQW,0:NEXT
84 PRINT"■■■■   PRESS A KEY TO START":GOTO1
```

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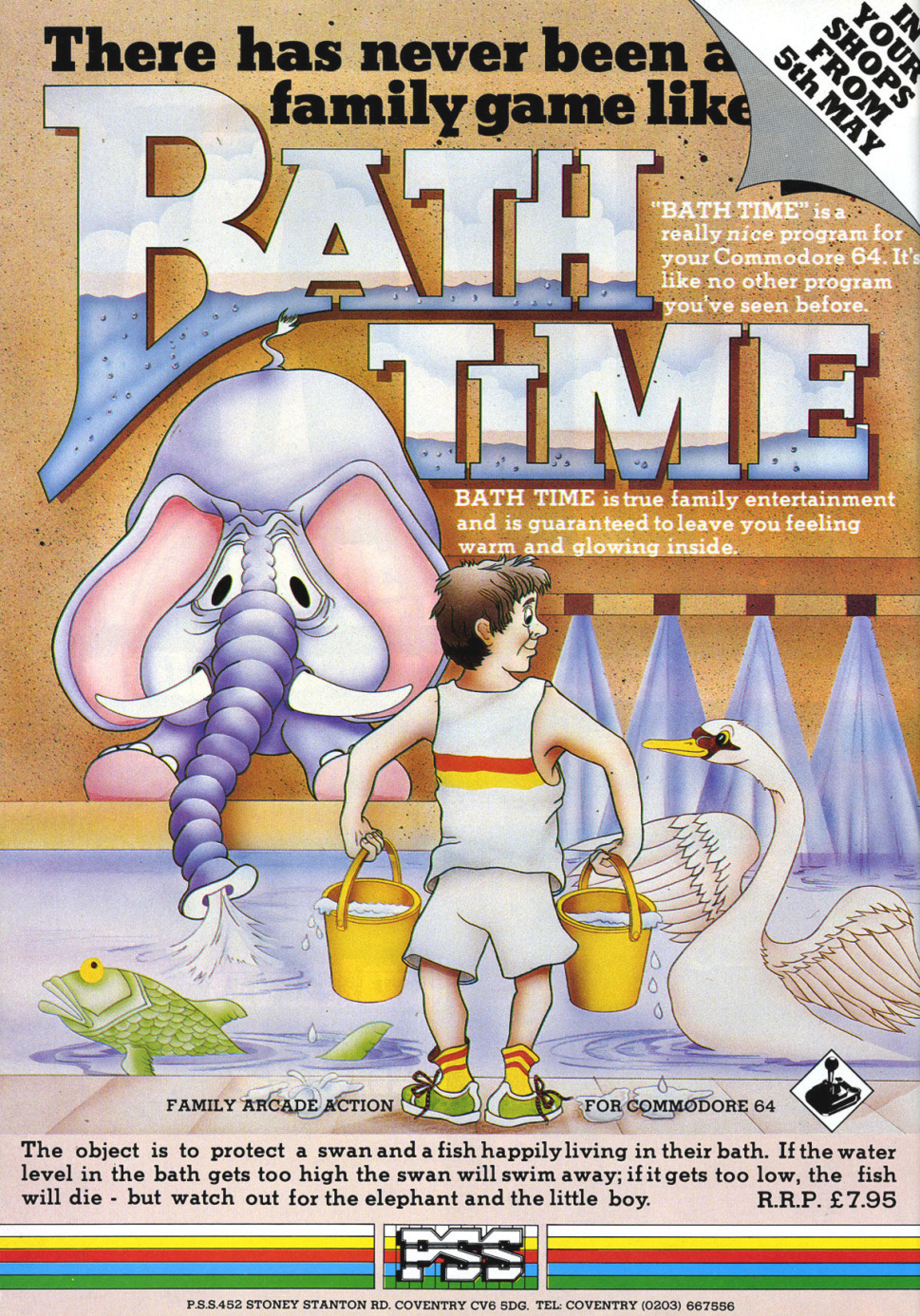
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Lines 100-120 Contain the data which makes up the sprites.

```
100 FORA=0TO124:READS:POKEA+832,S:NEXT
102 DATA0,0,0,0,0,0,0,0,0,1,80,0,2,208,0,3,208,0,3,208,0,0,64,0,1,80,0
103 DATA1,148,0,9,148,0,9,145,0,33,145,0,33,81,0,130,161,0
104 DATA1,80,0,1,16,0,1,4,0,1,4,0,0,65,0,1,68,0
105 DATA0,0,0,0,0,0,0,0,0,0,0,0,15,192,0,6,192,0,10,192,0,10,192,0,1,0
106 DATA0,53,96,0,53,96,0,198,72,3,6,72,3,6,0,6,64,0,5,64,0,0,4,64,0,16,64
107 DATA0,16,64,0,16,64,0,65,64
108 FORA=0TO62:READS:POKE16000+A,S:NEXT
109 DATA0,0,0,0,0,0,0,0,0,3,192,0,7,224,0,15,240,0,16,8,0,91,140,0,83,202,0
110 DATA147,201,0,153,153,0,7,224,0,13,176,0,1,128,0,3,224,0,3,96,0,3,192,0
111 DATA6,48,0,6,48,0,24,12,0,0,0,0
118 FORA=54272TO54296:POKEA,0:NEXT
120 RETURN
```

Lines 1000-1020 This routine creates the explosive noise which accompanies an unsuccessful attempt at landing your plane half-way up a tower block!

```
1000 POKE54296,15:POKE54292,128:POKE54291,128:POKE54290,129:POKE54287,200
1002 POKE54286,200:FORF=7TO15:POKE54296,F:FORR=1TO100:NEXT:NEXT:FORF=15TO0STEP-1
1004 POKE54296,F:FORR=0TO100:NEXT:NEXT:RETURN
1027 V=53248:POKEV+21,4:POKEV+28,4:POKEV+41,247:POKEV+37,241:POKEV+38,246
1030 RETURN
```

MAZE

Mazes have always been popular form of entertainment and have even carved a niche in modern culture (you'll have heard of the expression 'get lost', for instance). No doubt you've seen mazes before — but if your only experience is the Hampton Court Maze in Autumn, ie. when you can see through the hedges, then think again before entering this game, for computer mazes are a different cup of meat entirely.

Playing this maze game isn't quite what you'd expect because it's not you travelling around the maze, so much as the maze moving around you. All you get to guide you is a small 'window' giving you a portion of the whole — well, we wouldn't want to make it too easy, would we? Just move around the maze and you'll know when you've made it to the end when you reach the small white blob.

The game has been written for you to use certain keys of the keyboard to make your moves.But if you're the proud owner of a joystick, you simply have to make a few changes to the 'keychanging' routine in lines 80-86; variable 'E' needs to be changed to 56321 if you're going to use the front joystick or 56320 for the back joystick port. If you're going to be using the keyboard to control your moves, 'Z' moves you left, 'X' to go right, 'K' to go up and 'M' to go down.

And if you like the sound of this game but have not yet made the move up to a Commodore 64 and are sitting pretty with a VIC 20, the good news is that Mark has made the necessary conversions so that you can run the program. So, for all Commodore owners, we hope you'll be amazed with this game. It's all against the clock, so happy hunting!

Lines 0-4 Set up the SID chip and dimension the array A$ to hold the maze.

```
0 PRINTCHR$(142)CHR$(8)
1 POKE54296,15:POKE54277,128:POKE54278,128:POKE54276,33
4 DIMA$(100):HT$=""
```

Lines 5-8 Print the instructions for the game for the first-time player.

```
5 PRINT"♥▼▼▼▼▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶M*A*Z*E":PRINT"▼▼▶▶▶▶▶▶▶▶▶▶▶(C) 1982 DIGICOM"
6 POKE53281,15:POKE53280,9:PRINT"▼GUIDE YOUR MAN AROUND THE MAZE AS FAST ▼ AS PO
SSIBLE";
7 PRINT" USING KEYS":PRINT"▼▼       ■Z■ LEFT     ■X■ RIGHT":PRINT"              ▼▼■K■ U
P ■M■ DOWN"
8 PRINT"▼▼▶▶▶▶▶▶▶■PRESS A KEY TO PLAY"
```

Line 9 Waits for a key to be pressed before the game is begun.

```
9 POKE198,0:WAIT198,1
```

Lines 10-18 Clear the user-defined area of memory and read in the data which defines the graphics. The routine also turns the screen black and sets up the variables.

```
10 FORA=8448TO8460:POKEA,0:NEXT
11 POKE53272,24
12 PRINT"♥":POKE54296,15
13 REM HIGH RES
14 POKE53281,0
15 A=8712
16 READB:IFB=300THEN18
17 POKEA,B:A=A+1:GOTO16
18 FORA=8576TO8662:READB:POKEA,B:NEXT:POKE8199+58*8,0
```

Lines 20-65 Set up the maze using the dimensioned array, A$.

```
20 A$(10)="♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠"
21 FORA=0TO9:A$(A)=A$(10):NEXT
22 A$(11)="♠         ▐─¯▜       ♠"
23 P=1344
24 A$(12)="♠ ♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠ ♠"
25 A$(13)="♠ ♠                ♠ ♠"
26 A$(14)="♠ ♠ ♠ ♠♠      ♠♠ ♠ ♠ ♠"
27 A$(15)="♠ ♠ ♠  ♠      ♠♠ ♠ ♠ ♠"
28 A$(16)="♠ ♠ ♠  ♠♠    ♠♠  ♠ ♠ ♠"
29 A$(17)="♠ ♠ ♠   ♠♠♠♠♠♠   ♠ ♠ ♠"
30 A$(18)="♠ ♠       ♠♠       ♠ ♠"
31 A$(19)="♠ ♠♠♠♠♠   ♠♠   ♠♠♠♠♠ ♠"
32 A$(20)="♠         ♠♠         ♠"
33 A$(21)="♠♠♠♠♠♠♠ ♠ ♠♠ ♠ ♠♠♠♠♠ ♠"
34 A$(22)="♠ ♠   ♠ ♠ ♠♠ ♠ ♠     ♠"
35 A$(23)="♠ ♠ ♠ ♠ ♠ ♠♠ ♠ ♠ ♠ ♠ ♠"
36 A$(24)="♠ ♠ ♠ ♠ ♠ ♠♠ ♠ ♠ ♠ ♠ ♠"
37 A$(25)="♠ ♠ ♠ ♠ ♠    ♠ ♠ ♠ ♠ ♠"
38 A$(26)="♠ ♠ ♠   ♠♠  ♠♠   ♠ ♠ ♠"
39 A$(27)="♠ ♠ ♠    ♠  ♠    ♠ ♠ ♠"
40 A$(28)="♠ ♠ ♠♠♠♠ ♠  ♠ ♠♠♠♠ ♠ ♠"
```

```
41 A$(29)="♠      ♠ ♠    ♠ ♠      ♠"
42 A$(30)="♠ ♠♠♠♠ ♠       ♠ ♠♠♠♠  ♠"
43 A$(31)="♠ ♠  ♠ ♠♠♠♠♠♠♠♠♠ ♠   ♠ ♠"
44 A$(32)="♠ ♠  ♠           ♠   ♠ ♠"
45 A$(33)="♠ ♠  ♠♠♠♠♠   ♠♠♠♠♠   ♠ ♠"
46 A$(34)="♠                      ♠"
47 A$(35)="♠ ♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠"
48 A$(36)="♠    ♠                 ♠"
49 A$(37)="♠♠♠♠   ♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠ ♠"
50 A$(38)="♠  ♠♠♠♠♠               ♠"
51 A$(39)="♠          ♠♠          ♠"
52 A$(40)="♠♠♠♠♠♠♠♠♠  ♠♠♠♠  ♠♠♠♠♠♠♠"
53 A$(41)="♠      ♠♠  ♠♠  ♠♠      ♠"
54 A$(42)="♠ ♠♠♠   ♠♠    ♠♠   ♠♠♠ ♠"
55 A$(43)="♠    ♠   ♠♠  ♠♠   ♠    ♠"
56 A$(44)="♠ ♠ ♠              ♠ ♠ ♠"
57 A$(45)="♠ ♠ ♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠ ♠ ♠"
58 A$(46)="♠ ♠                  ♠ ♠"
59 A$(47)="♠ ♠♠♠♠♠ ♠      ♠ ♠♠♠♠♠ ♠"
60 A$(48)="♠     ♠ ♠♠♠♠♠♠♠♠ ♠     ♠"
61 A$(49)="♠♠♠♠♠      ♠♠      ♠♠♠♠♠"
62 FORA=0TO49:A$(50+A)=A$(49-A)
63 NEXT
65 A$(88)="♠                      ♠"
```

Lines 66-71 Contain the data for the user-defined graphics.

```
66 GOTO72
67 DATA255,129,255,129,255,129,255,129
68 DATA129,90,36,126,255,60,36,195,255,127,63,31,15,7,3,1,128,192,224,240,248
69 DATA252,254,255,0,126,24,24,24,24,24,24,0,60,24,24,24,24,60
70 DATA0,126,64,64,126,64,64,126,0,66,102,90,66,66,66,66,0
71 DATA300
```

Line 72 Sets up the variables and starts the clock.

```
72 A=86:X=20:TI$="000000"
```

Lines 73-87 Form the 'window' of the maze that will be seen on-screen. This routine also updates the time spent in the maze and checks to see if you have walked into a wall.

```
73 PRINT"{control characters}"
74 FORB=ATOA+4
75 PRINTTAB(8);A$(B)
76 NEXT
77 IFPEEK(P+X)<>32THEN88
78 POKEP+54272+X,5:POKEP+X,66
79 PRINT"{control characters}┌_ ‖:";MID$(TI$,3,2)":";RIGHT$(TI$,2);"{control character}
80 E=PEEK(197):IFE=64THEN73
81 POKE54272,100:POKE54273,100
82 IFE=36THENA=A+1:M=1
83 IFE=37THENA=A-1:M=2
84 POKE54272,0:POKE54273,0
85 IFE=12THENX=X-1:M=3
86 IFE=23THENX=X+1:M=4
87 GOTO73
```

Lines 88-95 Move your character according to the instructions conveyed via the keyboard (or joystick, if you have made the necessary changes suggested in the text).

```
88 IFM=1THENA=A-1
89 IFPEEK(P+X)=67ORPEEK(P+X)=68THEN96
90 POKE54272,100:POKE54273,100
91 IFM=2THENA=A+1
92 IFM=3THENX=X+1
93 IFM=4THENX=X-1
94 POKE54272,0:POKE54273,0
95 GOTO73
```

Lines 96-102 The 'end of game' routine. This routine prints out the time taken to complete the maze successfully.

```
96 FORA=255TO0STEP-4:FORB=5TO15STEP3
97 POKE54296,B:POKE54272,200:POKE54273,A
99 NEXTB,A:POKE54272,0:POKE54273,0:POKE53272,21
100 PRINT"{control characters}YOUR TIME WAS ";MID$(TI$,3,2);" MINUTES ";RIGHT$(TI$,2);" SE
CONDS"
101 PRINT"{control characters}ANY KEY TO RESTART{control character}"
102 IFPEEK(197)<>64THEN102
```

Lines 103-108 Reset all the variables and offer the user another game.

```
103 IFPEEK(197)=64THEN103:PRINT"{control character}"
104 TI$="000000"
106 RESTORE
107 PRINT"{control characters}"
108 RUN
```

Lines 110-118 Contain data for user-defined graphics.

```
110 DATA0,126,70,74,82,98,126,0,0,56,24,24,24,24,126,0,0,126,66,4,120,98,126,0
112 DATA0,126,2,62,6,6,126,0,0,64,64,64,96,100,126,4,0,126,64,64,126,6,126,0
114 DATA0,96,96,126,98,98,126,0,0,126,2,2,6,6,6,0,0,126,66,126,66,66,126,0
116 DATA0,126,66,66,126,6,6,0,0,0,24,0,0,24,0,0,0
118 DATA0,126,24,24,24,24,24,24,0
```


VIC 20 MAZE

Lines 0-4 Set up the sound chip and dimension the array A$ to hold the maze.

```
0 PRINTCHR$(142)CHR$(8)
1 POKE51,255:POKE56,19
2 POKE55,255:POKE56,19:CLR
3 IFPEEK(5120)=28THEN12
4 DIMA$(100)
```

Lines 5-8 Print the instructions for the game for the first-time player.

```
5 PRINT"sQQ]]]]]]]M*A*Z*E]]]]]]]]]]]Q(C)19
82 DIGICOM"
6 POKE36879,93:PRINT"QGUIDE YOUR MAN ROU
ND Q]THE MAZE AS FAST AS Q]]POSSIBLE USI
NG";
7 PRINT" KEYS:]Q RZrLEFT  RXrRIGHT   RKr
 UP  Q]]]]]]]RMr DOWN"
8 PRINT"QPRESS A KEY TO PLAY!"
```

Line 9 Waits for a key to be pressed before the game is begun.

```
9 POKE198,0:WAIT198,1
```

Lines 10-19 Clear the user-defined area of memory and read in the data which defines the graphics. The routine also turns the screen black and sets up the variables.

```
10 PRINT"QQQK PLEASE WAIT!"
11 FORA=0TO1024:POKE5120+A,PEEK(32768+(A
/2)):NEXT
12 PRINT"s":POKE36878,15
13 POKE36865,200:POKE36867,255:POKE36869
,253:POKE36879,8:POKE36865,15
14 PRINT"SQ        πM*A*Z*E£"
15 A=6160
16 READB:IFB=300THEN20
17 POKEA,B
18 A=A+1
19 GOTO16
```

Lines 20-65 Set up the maze using the dimensioned array, A$.

```
20 A$(10)="aaaaaaaaaaaaaaaaaaaaaa"
21 FORA=0TO9:A$(A)=A$(10):NEXT
22 A$(11)="a         Ecd£         a"
23 P=7856
24 A$(12)="a aaaaaaaaaaaaaaaaaa a"
25 A$(13)="a a                a a"
26 A$(14)="a a a aa      aa a a a"
27 A$(15)="a a a  a      a  a a a"
28 A$(16)="a a a  aa    aa  a a a"
29 A$(17)="a a a   aaaaaa   a a a"
30 A$(18)="a a       aa       a a"
31 A$(19)="a aaaaa   aa   aaaaa a"
32 A$(20)="a         aa         a"
33 A$(21)="a aaaaa a aa a aaaaa a"
34 A$(22)="a a   a a aa a a   a a"
35 A$(23)="a a a a a aa a a a a a"
36 A$(24)="aaa a a a aa a a a aaa"
37 A$(25)="a a a a a    a a a a a"
38 A$(26)="a a a   aa  aa   a a a"
39 A$(27)="a a a    a  a    a a a"
40 A$(28)="a a aaaa a  a aaaa a a"
41 A$(29)="a      a a  a a      a"
42 A$(30)="a aaaa a      a aaaa a"
43 A$(31)="a a  a aaaaaaaa a  a a"
44 A$(32)="a a  a          a  a a"
45 A$(33)="a a  aaaaa  aaaaa  a a"
46 A$(34)="a                    a"
47 A$(35)="a aaaaaaaaaaaaaaaaaaaa"
48 A$(36)="a    a               a"
49 A$(37)="aaaa   aaaaaaaaaaaaa a"
50 A$(38)="a  aaaaa             a"
51 A$(39)="a         aa         a"
52 A$(40)="aaaaaaa  aaaa  aaaaaaa"
53 A$(41)="a     aa  aa  aa     a"
54 A$(42)="a aaa  aa    aa  aaa a"
55 A$(43)="a   a   aa  aa   a   a"
56 A$(44)="a a a            a a a"
57 A$(45)="a a aaaaaaaaaaaaaa a a"
58 A$(46)="a a                a a"
59 A$(47)="a aaaaa a    a aaaaa a"
60 A$(48)="a     a aaaaaa a     a"
61 A$(49)="aaaaa     aa     aaaaa"
62 FORA=0TO49
63 A$(50+A)=A$(49-A)
64 NEXT
65 A$(88)="a                    a"
```

Lines 66-71 Contain the data for the user-defined graphics.

```
66 GOTO72
67 DATA255,129,129,255,165,165,255,129,1
29,255,165,165,255,129,129,255
68 DATA0,0,0,0,129,66,60,102,126,255,189
,36,0,0,0,0
69 DATA0,255,0,127,0,63,0,31,0,15,0,7,0,
3,0,1,0,0,0,128,0,192,0,224,0,240,0,248,
0,252
70 DATA0,254
71 DATA300
```

Line 72 Sets up the variables and starts the clock.

```
72 A=86:X=11:TI$="000000"
```

Lines 73-87 Form the 'window' of the maze that will be seen on-screen. This routine also updates the time spent in the maze and checks to see if you have walked into a wall.

```
73 PRINT"SQQQQQ"
74 FORB=ATOA+4
75 PRINTA$(B);
76 NEXT
77 IFPEEK(P+X)<>32THENGOTO88
78 POKEP+30720+X,5:POKEP+X,66
79 PRINT"SEQQQQQQQQQQQQQQQ]]]]]]TIME=";M
ID$(TI$,3,2);":";RIGHT$(TI$,2);"£"
80 E=PEEK(197):IFE=64THEN73
81 POKE36875,220
82 IFE=36THENA=A+1:M=1
83 IFE=44THENA=A-1:M=2
84 POKE36875,0
85 IFE=33THENX=X-1:M=3
86 IFE=26THENX=X+1:M=4
87 GOTO73
```

Lines 88-95 Move your character according to the instructions conveyed via the keyboard.

```
88 IFM=1THENA=A-1
89 IFPEEK(P+X)=67ORPEEK(P+X)=68THEN96
90 POKE36875,200
91 IFM=2THENA=A+1
92 IFM=3THENX=X+1
93 IFM=4THENX=X-1
94 POKE36875,0
95 GOTO73
```

Lines 96-102 The 'end of game' routine. This routine prints out the time taken to complete the maze successfully.

```
96 FORA=255TO128STEP-4:FORB=5TO15STEP3
97 POKE36878,B
98 POKE36876,A
99 NEXTB,A
100 POKE36876,0
101 PRINT"SQQQQQQQQQQQQQ  ANY KEY TO RES
TART"
102 IFPEEK(197)<>64THEN102
```

Lines 103-106 Reset all the variables and offer the user another game.

```
103 IFPEEK(197)=64THEN103
104 TI$="000000"
105 PRINT"SEQQQQQQQQQQQQQQQ]]]]]]TIME=";
MID$(TI$,3,2);":";RIGHT$(TI$,2);"£"
106 RESTORE
```

WANTED...

...Good programs to feature in our magazine. Obviously, as this is our first issue we wanted to give you something special in the way of listings — and if you want the best you go to the best, which is why Mark Greenshields was our first choice. However, in much the same way that you haven't heard of us before, we haven't heard of you... yet.

If you would like to carve your niche in a small part of programming history, why not send us your programs and, if they measure up to the standards we've tried to set, we'll publish them. (We pay better than most — but they've got to be good!)

Should you feel inspired to submit any listings, please accompany them with hard copy of the listing, some instructions for play, a breakdown of the program's content (line by line, where necessary), and a copy of the game on cassette. We will evaluate the programs as quickly as possible and readers will be informed if their submissions will be used. All programs will, of course, be returned.

Please send your programs to: *Your 64, 14 Rathbone Place, London W1P 1DE.*

Commodore has a team of talent scouts actively seeking out software wherever it lurks, slapping the logo on, and then selling it around the world. Its freelance 'fingertips' are thought to bring in several million pounds each year. Chief scout is Gail Wellington and Paul Walton *asked her how the system works — and how potential program writers can turn it to their advantage.*

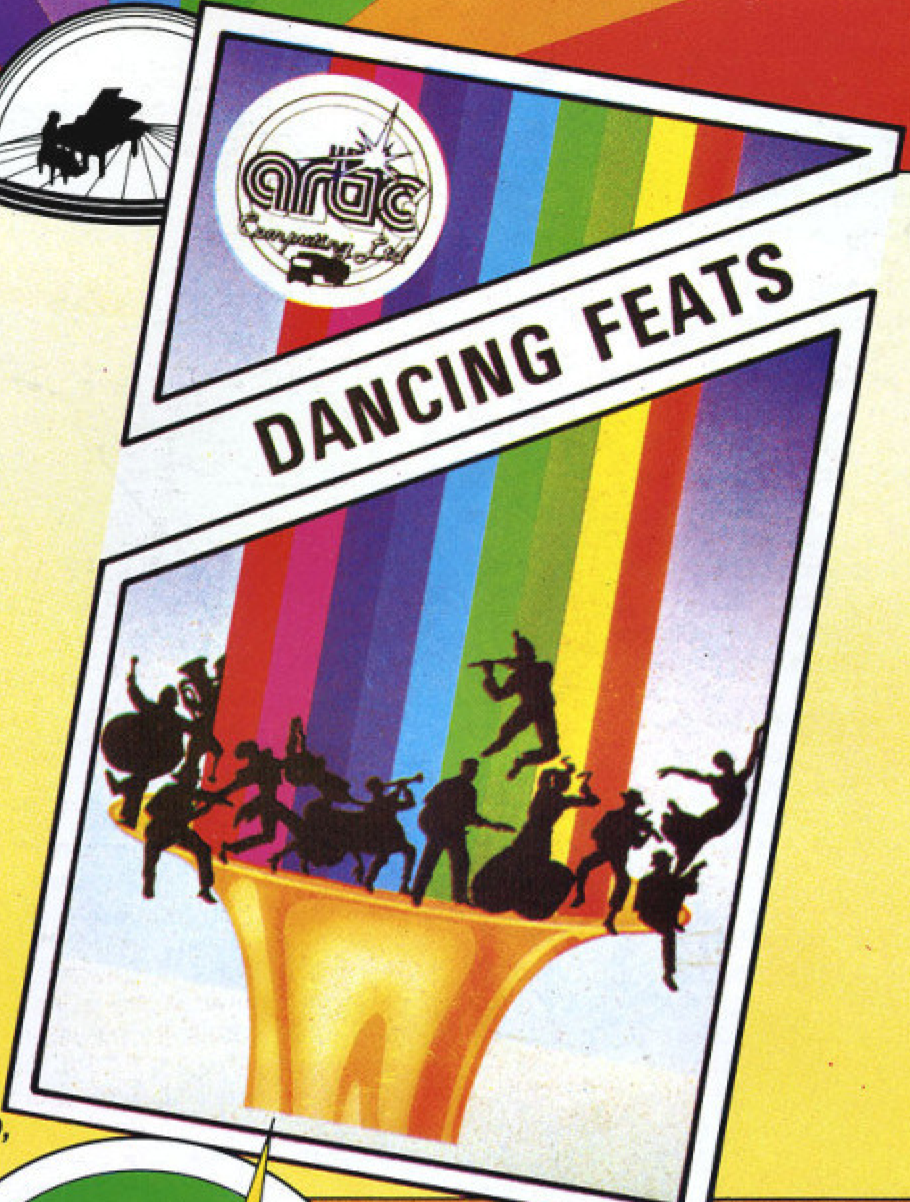


Gail Wellington, keeping her eye on the software market, ensures that sub-standard software gets the boot.

Your 64: How big is the Commodore software catalogue . . . where does most of it come from?
Gail Wellington: We have about 200 titles gathered from all over the world. The majority of it comes from the United States and here in Britain — it's about a 50:50 split, with a few other programs coming in from here and there. Other than some arcade stuff in the States, we do very little of it in-house.
Y64: So you actually have a team of talent scouts out there scouring for software?
GW: Yes, although people do send us things, we also acquire product that's already on the market. We design software, we find the most suitable people to code — there are lots of possibilities.
Y64: How many scouts are there, and are they hunting down business or games software?
GW: Between home recreation and education software there are five of us. Some are more involved in locating it, and others more in marketing it — dealing with the ideas behind it and that kind of thing. Just two people look for business software, though I also get involved as well. There's one other person who gets involved on all the products and checks for quality.
Y64: So what's the best way to scout for good software?
GW: There's no best way . . . the only way is what works. We try all kinds of things and good software comes in all kinds of ways. There's no hard and fast formula — if there was it would be an easy job, and it isn't! Although I have a lot of software sent in to me, very little is marketable. We probably get three or four pieces sent in every day and if we find one in a month that's any good, we think we're pretty lucky.
Y64: Can you name some of the packages that you've struck lucky with?
GW: Well there's *Gortek and the Microchips*. That's a cartoon storybook with software that teaches children, young children, the very rudiments of Basic. That came in the post, or at least the book part of it did. Three school teachers in Hampshire wrote asking how they could get the idea published. We also get a lot of games sent in, but most of them are just copies of arcade games, quite literally. They may have coded it themselves but they're not idea creative. Probably only four or five per cent are really creative.

Other titles . . . well there's the *Rolf Harris Picture Builder*. That's one that came from an author we'd worked with before. He sends us stuff fairly regularly. We made some suggestions and contributed to the development of the idea and he went away and implemented it. And there's also a high-resolution art package that came in through the post . . . that's due out soon.
Y64: Are there any pat places to go looking for software? What about the computer clubs, the schools?
GW: No, not really; very few are generating anything hot. It's more a question of keeping your eyes and ears open, letting it be known that you're interested, scouting through software houses and cultivating contacts.
Y64: If Commodore users want to show you their software, what's the best way for them to present it — to stand the best chance of being seen? Do you look at everything that's sent in?
GW: Obvious points really . . . mainly it should include instructions on loading and operating. And yes, we do look at every piece of software that comes in and everyone gets an evaluation report telling them what's wrong and where it could be improved. If the software is way off the mark then it's an A4 sheet that has a lot of ratings on one side and a lot of notes on the reverse. But if the software has potential then it could be much more extensive than that. Then we might suggest a number of changes on the form and we'll ask them to send it back afterwards so we can take another look. Then again, in some cases we'll say it looks really good and that we'd like to make an offer for it; they might come in and see us and we'd probably tell them the changes we'd expect before we can accept it.
Y64: Okay, the big moment has arrived for some lucky author . . . what kind of terms do you offer? Is there one standard contract and royalty?
GW: The wording is standard — but the terms are not necessarily so. We might consider outright purchase — or a royalty. In most cases it's a royalty on sales, but that all depends on how good the software is, and on the individual. We're open to negotiation but it wouldn't be as much as 40 per cent — there'd be no profit in that for us.
Y64: Can we tie any of this down to real figures? I mean, for instance, how much royalty might an amateur expect if you were to sell his software?
GW: Again, it all depends on how good the software is, how broad its appeal, and what medium it's suitable for. David Simons, who wrote *Simons Basic* is collecting nice fat cheques on a quarterly basis. The same is true of Andy Spencer who wrote *International Soccer*. These have been very well accepted around the world. But if somebody wrote something appealing only to machine code programmers, then instead of big fat cheques they'll just be getting nice modest ones!
Y64: Do you run a stable of software authors, people who write regularly and offer their work exclusively to you?
GW: I don't tie people down to a contract on a 'per product' basis. If they're getting a good deal and a good return on the software, then they'll probably supply more. For some authors it's just like writing books . . . they're good at churning them out repeatedly. Other times you find people who are only good for one or two products — they don't seem able to produce anything else. 64

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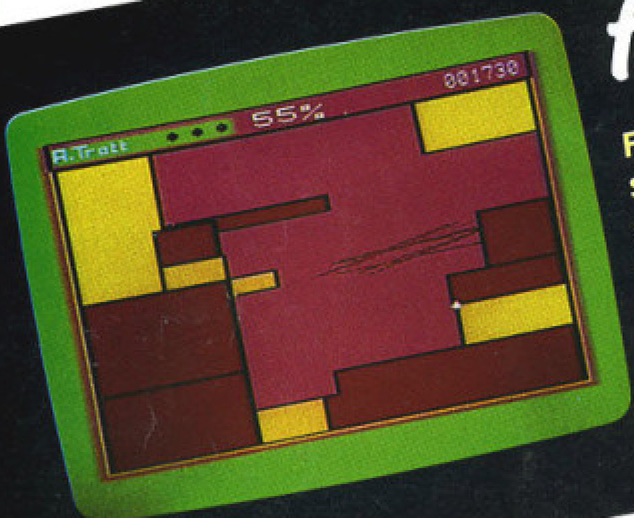
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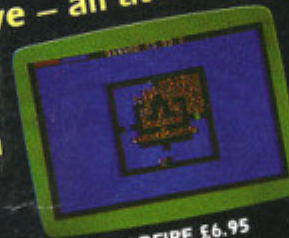
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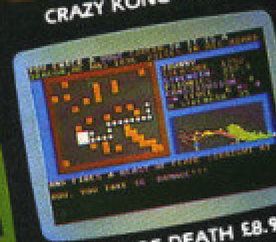
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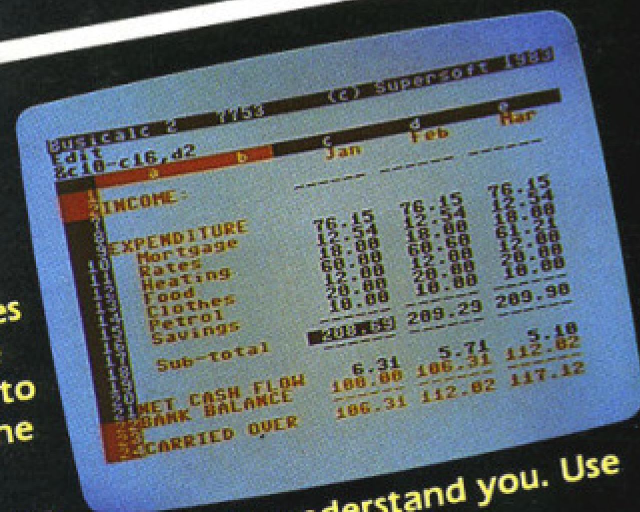


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